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TOLAND AND LEIBNIZ

"Il paroit homme d'esprit et de sçavoir,
et il semble seulement qu'il a besoin
d'un peu plus de modération."

LEIBNIZ

I

THE history of the human mind is not, as Hegel assumed, an impersonal movement, in which human thought develops according to the law of dialectic and in which the persons are merely substitutes for the world mind; but rather a very complex and varied dialogue which is sometimes personal (*i.e.*, between persons or between groups) and sometimes impersonal (*i.e.*, between standpoints or between series of propositions which seem to have a sort of objective connection). "Non ego tibi, sed causa causae respondet" (Hieronymus) is the one extreme, "persona personae respondet" the other. In fact both forms nearly always go together; merely one of them prevails. Since man is not intellect pure and simple, but feeling and will as well, all three of them are implied in every one of his answers; and he does not always succeed in striking the right balance. Who has not participated in discussions in which a theory was rejected merely because it was formulated by a specific person, and at others which were boring because of their lack in personal reference and vitality? If we stress, in opposition to Hegel, the importance of the personal element, we should not overlook the fact that often the seemingly impersonal is personal and *vice versa*.

I shall treat in this paper, as an example of the mixture of personal and impersonal elements, a discussion between Leibniz and Toland which gains in interest if compared with that between

Berkeley and Toland.[1] Though Berkeley and Toland were the two outstanding Irish philosophers of their time they never met[2] and their discussion remained wholly impersonal, but was for that reason no less outspoken. Berkeley's philosophy is a violent reaction against Deism, Free-thought (or what he called "Scepticism, Atheism, and Irreligion" or "Minute Philosophy") and against Materialism; that is, against everything Toland stood for. Toland's philosophy contains the thesis to which Berkeley formulates the antithesis.[2a] I do not for a moment deny that Berkeley attacks the general tendency towards freethought and towards materialism, inherent in modern philosophy (Descartes, Gassendi, and Hobbes), science and theology. But it must not be forgotten that in all his impersonal critique a personal discussion is implied. His teacher, Dr. Peter Browne, the Provost of Trinity College, Dublin, had started criticizing Toland's *Christianity Not Mysterious*, in 1700. Berkeley followed his lead. From Toland's *Letters to Serena* (1704) he seems to have derived the conclusion that freethought inevitably leads to materialism, for he never mentions the latter in the titles of his books. Toland's name never appears, but the attentive reader will notice many hidden references to him.[3] The paradoxical fact is that this discussion which remains impersonal in the case of Berkeley becomes personal in the case of Leibniz, and gains in interest because Toland's relations with Leibniz mark the happiest and greatest time of his life.[4]

[1] *Cf.* my paper, "John Toland and the Age of Enlightenment," *The Review of English Studies*, April, 1944, and *Notes and Queries*, 25.9.1944.

[2] Toland had left Ireland already in 1687.

[2a] (Note added during the revision). I am glad to note that this is confirmed by G. A. Johnston, *The Development of Berkeley's Philosophy*, 1923, *passim;* cf. p. 342: Berkeley's "general philosophical position is intended to be, in the main, a criticism of Toland"; p. 337, "Nearly all his books have them (the free-thinkers) in view."; p. 328 ff., for Berkeley's constant critique of the Deists and for its motives; p. 342, for the difference between Browne's and Berkeley's critique of Toland.

[3] *Cf. Alciphron.*, 1. Dial. §5 (fight against prejudice); §6 (prejudice the basis of the diversity of religions); §8 (Toland's religious development); 2. Dial. §8 (Toland's doctrine of circulation and revolution); §11. Berkeley's antithesis: The Deists are prejudiced against religion.

[4] *Cf.* besides the material quoted in the text, the following letters: 1. Leibniz to Toland, 30.4.1709 (Toland, *A Collection of Several Pieces*, 1722, Vol. II, 383); 2. Toland to Leibniz, 14.2.1710 (*op. cit.*, 388); 3. Toland to Leibniz, 22.2.1710 (*op. cit.* 395); 4. Leibniz to Toland, 1.3.1710 (*op. cit.* 400). Unpublished are: 5. Toland to Leibniz, 6.10.1708, sending him his *Oratio Philippica;* 6. Leibniz to Toland (written on the back of 7, a short

II

Toland suddenly found himself an actor on the stage of history. As a member of the legation which brought the Act of Succession to Hanover, he arrived there together with Lord Macclesfield in July, 1701 and was received as a most honored guest and lavishly treated. He handed his *Anglia Libera: or, the Limitation and Succession of The Crown of England explain'd and asserted,* expressly written for this purpose, to the Electress Sophia, a lady of singular gifts and remarkably acute judgment, a friend of Leibniz, well versed in philosophy and history. During the five or six weeks of his stay he had many discussions with her and she formed this opinion of him: "Je trouve toujours son intention droite et bonne malgré la rage des ennemis."[5] Leibniz, who was anxious to see him, was present at some of these talks and was afterwards at pains to discourage Toland's publishing them. He had read his *Life of Milton* and judged from his writings that he was a man of spirit and knowledge, lacking in moderation, badly treated and unjustly accused of atheism by those ignoramuses who dub as atheists all those "qui ne se rendent pas à tous préjugés".[6] When Toland brought him his *Christianity not Mysterious* he wrote almost at once in his obliging manner his *Annotatiunculae,* dated 8.8.1701, sent his book, probably together with his remarks, to Sophia Charlotte, first Queen of Prussia and Sophia's daughter,[7] and handed his remarks to the delighted author.[8] Toland went on to Berlin,

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letter of Toland's dated 25.2.1710), about Bruno, his death and importance; 8. Leibniz to Toland, without date, about the political situation in England. *Cf.* further Leibniz's correspondence with the Electress Sophia, the Queen Sophia Charlotte, Burnett de Kemney and Crusen. Klopp, Leibniz's *Werke,* Vols. III, VIII, and IX. Of special importance is C. I. Gerhardt, *Die philosophischen Schriften von G. W. Leibniz,* Vol. VI, 499 ff. Finally the correspondence of the two princesses, the *Memoirs* of Erman and Pöllnitz; Guhrauer, *Leibniz,* Vol. II, 224; and Carlyle, *Frederick the Great,* Bk. I, ch. 4. The unpublished letters are in Hanover; *cf.* E. Bodemann, *Der Briefwechsel des Gottfried Wilhelm Leibniz in der Kgl. öff. Bibl. zu Hannover,* Hannover, 1889, 341; Doebner refers to R. Doebner, *Briefe der Königin Sophie Charlotte von Preussen und der Kurfürstin Sophie von Hannover an hannoversche Diplomaten.* Publikationen aus den Kgl. Preussischen Staatsarchiven, Vol. 79, Leipzig, 1905. For Leibniz's previous struggle against atheists and free-thinkers, *cf.* Gerhardt, *op. cit.,* IV, 6 ff.; 105 ff.

[5] *To Leibniz,* 29.10.1701; Klopp, *op. cit.,* VIII, 294.
[6] *To Burnett de Kemney,* Gerhardt, III, 279.
[7] Sophia to Leibniz, 15.10.1701; Klopp, VIII, 289.
[8] Leibniz to Burnett, 27.2.1702; Klopp, VIII, 333.

laden with the presents of the Court; Leibniz intended to follow,[9] and was actually in Oranienburg about the 21.10.1701, working for the new "Société Royale des Sciences", but he probably did not again meet Toland who was in Holland at the end of October and the beginning of November, awaiting a favorable wind for England where he arrived at the end of the year.

There he composed another pamphlet, *Reasons for addressing his Majesty to invite into England their Highnesses, the Electress Dowager and the Electoral Prince of Hanover,* etc., 1702 (not 1703). This he sent, together with the *Paradoxes of State* (not written by him, but by Shaftesbury), to Hanover. Leibniz complained: "Il a fait cela sans nous rien dire, et sans ordre pour cet effet."[10] The Electress, who had asked him not to write about her, was shocked and informed him of her displeasure.[11] After that she showed great reserve towards him who cherished the plan of becoming tutor to the Electoral Prince, one day to be the King of England.[12] She received so many letters against him that she accepted the advice of the Baron von Schütz and the Bishop of Salisbury and declined to receive him any more. She and Leibniz even tried to prevent his return to Germany, in vain, however, for the letter arrived too late.[13] But in spite of all this she remained favorable to him. She thought, how distinguished he must be, since so many people were hostile to him, and were unable to bring any other accusation against him than that he had no religion. Wittily she remarked: "Quand on parle contre le revenu des ecclésiastiques, cela ne se pardonne pas ni en ce monde ici ni dans l'autre."[14] In her eyes his only fault was his lack of judgment, common to many scholars. "Il a beaucoup d'esprit, mais pas beaucoup de jugement, quand il n'a point de directeur."[15]

Toland, furnished with new introductions and bringing with him the second edition of Bayle's *Dictionary,* reappeared in Berlin on July 24, 1702 and, following an invitation of the Queen, on July 28, at the Court in Lützenburg (=Charlottenburg), and was very

[9] Leibniz to Burnett, 31.8.1701.
[10] Klopp, VIII, 342.
[11] Sophia to Bodmer, 18.7.1702; Doebner, *op. cit.,* 219.
[12] Klopp, VIII, 318.
[13] Leibniz to Burnett, 27.2.1702; Klopp, VIII, 334; *cf.* 351, 352, 356 f.
[14] To Bothmer, 26.6.1702; Doebner, *op. cit.,* 219.
[15] To Leibniz, 22.10.1701; Klopp, VIII, 293.

well received by the King and Queen (in spite of the countermeasures of the Secretary of State, Lord Nottingham).[16] He even saw the Electress who, officially evading him, still enjoyed his jokes. Already during his first stay at Berlin he had had discussions with theologians, chiefly with Beausobre. But now he had conversations with the Queen whom he admired intensely for her almost infinite reading and for her knowledge of the most abstruse problems of philosophy, whereas she said: "Il a infinement de l'esprit, mais je le trouve très imprudent et hardi."[17] The outcome of these talks was his *Letters to Serena.* (Later, in 1712, he translated one of her letters, under the title *A Letter against Popery.*) The Queen, moreover, made him discuss in her presence with Leibniz, Beausobre, Lenfant and Dobrecenzky the problems of republicanism, rationalism and empiricism, spiritualism and materialism, that is, whether there is something beyond the senses and beyond matter. In Berlin Toland wrote reports on the Courts of Prussia (18.8.1702) and Hanover (23.9.1702), containing his condensed impressions of his two journeys. This time he did not visit Hanover, but went on to Stettin, breaking the journey at the King's brother's castle at Schwedt on the Oder, returned to Berlin about October 24, took leave of the Queen before November 11, 1702 and went directly to Holland, *via* Magdeburg, Hanover and Osnabrück.[18] Having returned to England, he published the *Letters to Serena,* 1704, and *An Account of the Courts of Prussia and Hanover,* 1705. Here he mentions Leibniz as a Man of Letters, mathematician and historian: "I cannot agree to his metaphysical notions, but possibly my own apprehension may be in fault" (p. 55). Leibniz's judgment was no longer favorable. He complained about Toland's "méchante manière qu'il feroit bien de quitter".[19]

He sees Leibniz for the third time about October 11, 1707[20] on his journey to Berlin, Dusseldorf, Vienna and Prague, and gives him his pamphlet on the Elector Palatine.[21] The remaining correspondence covers his years in Holland, 1708-1710, and reveals that he sent Leibniz his minor output, his *Oratio Philippica,* his pamphlet against Sacheverell, his *Adeisidaemon* and *Origines*

[16] Doebner, *op. cit.* 161.
[17] Doebner, *op. cit.* 14.
[18] Doebner, *op. cit.* 23.
[19] Klopp, VIII, 33.
[20] Doebner, *op. cit.* 253.
[21] Gerhardt, *op. cit.,* III, 315.

Judaicae. During the printing of Leibniz's *Théodicée* he is in Amsterdam, asks and probably obtains permission to read the proofs. Then the correspondence breaks off, not without deeper reason.

Historians have paid little or no attention to this discussion of the two philosophers. True, it cannot be compared in philosophical importance with Leibniz's great discussions with Locke which began in 1696 and culminated in his *Nouveaux Essays sur l'entendement humain*, and with Newton, as contained in his correspondence with Clarke, 1715-16. But it supplements these discussions in an important point and is not without interesting implications and consequences. To be sure, Leibniz was not impressed by Toland's propaganda for Bruno's *Spaccio*. The medicine, given him in two doses, the first in a short letter, the second in a most circumstantial account of the book, accompanied by a translation of three articles, provoked this comment on Bruno: "Son génie paroit médiocre, et je ne crois pas qu'il ait été grand astronome ny grand philosophe." He resented Bruno's as well as Toland's lack of moderation. Approving the fight against superstition, he strongly objected to the identification of religion and superstition. Leibniz, a deeply religious personality, who even created a new expression of Protestantism by combining the Protestant tradition with the modern scientific interpretation of the Universe, also believed in natural religion, but merely as a basis of Christian religion and of the different Christian Churches and Sects which he desired to reunite. Thus he became a defender of the Christian religion against Free-thought and was like Berkeley opposed to Toland's Deism.

III

Leibniz agrees with Toland and Locke that nothing in religion ought to be contrary to reason; but it does not follow from this that nothing in religion transcends reason (*sit supra rationem*). On the contrary, he objects in his *Annotatiunculae*, like Norris (and Malebranche), that Toland overlooks the finite character of the human understanding. We do not comprehend the Infinite; therefore God's nature, being infinite, like that of all substances which imply something infinite, is incomprehensible to us; we understand

perfectly only incomplete abstract notions like number, figure, etc. For complete understanding demands the formation of distinct and adequate ideas; that is, an analysis of all the terms used into their basic elements, as we are able to do in the case of numbers.[22] If therefore we mean by mystery what is beyond our present understanding, then countless mysteries exist even in nature. The inner texture of water, *e.g.*, is a mystery at present, though later on a sufficient explanation may be given. If, however, we call "mystery" what transcends all created reason, then, it is true, there are no natural phenomena beyond our understanding, but all kinds of individual substances are, because they imply the Infinite. Thence follows our inability to give a full account of the Universe. There remains therefore room for "mysteries" and "miracles" if we understand by the latter events which we with our finite intellect cannot derive from the laws of created nature which are known to us. They, as *mysteria transitoria,* are not contradictory; they merely transcend the power of our understanding. In short, answering the very title of Toland's *Christianity Not Mysterious,* Leibniz formulates here the thesis which he is to develop later on at great length, criticizing Bayle in his *Théodicée;* namely that nothing is allowed in theology which is contrary to reason (*Widervernünftig*), but that what is above reason (*Übervernünftig*) is not therefore excluded.

Leibniz stresses the fact that there is something *beyond* human reason and he will soon add that there is something *beyond* the senses and *beyond* matter. It is this appreciation of the phenomenon of transcendence, or better of *transcendere*[23] which distinguishes Leibniz's *Transcendentalism* from Toland's *Immanentism.* In this point he anticipates Kant's critique of Locke and Hume. Leibniz and Kant are both Transcendentalists, with the difference, that Leibniz uses this standpoint as a critical principle against a shallow over-rating of human reason, and against a one-sided empiricism

[22] "Porro *comprehensionem* appello non tantum cum distinctae interveniunt ideae, sed et cum adequatae; id est cum non tantum propositi termini habetur definitio sive resolutio, sed et quivis terminus eam ingrediens rursus resolutus habetur usque ad primitivos; ut in numeris experimur." *Several Pieces,* II, Appendix, 71.

[23] "Atque haec quidem omnia sane ostendunt multo minus mirandum esse si in rebus divinis occurrunt, quae rationis vires longe transcendunt" (*op. cit.* 76).

and materialism, whereas Kant adds the critique of every sort of rationalistic metaphysics, that of Leibniz included, by excluding the transcendent, and admitting merely the transcendental, use of human reason. At this point, where we are merely concerned with the critical use which Leibniz makes of his principle, we must admit that he is right in his more or less negative theses that the human intellect is not infinite but finite; that it is unable to give an exhaustive analysis of phenomena which are infinitely complex[24]; and that there is something beyond reason. The experience of human life confirms this by innumerable examples. But it is doubtful whether more than negative consequences can be drawn from these premises, or, theologically speaking, whether we can base on them more than a Negative Theology, and whether Leibniz is entitled to use them as a basis for a Positive Theology and for a justification of the dogmas of revealed religion. He accepts dogmas as above reason, as long as they do not contradict reason.

Toland and Leibniz both accept the "natural light", but in very different senses; Toland as reason, in Locke's sense, and therefore as identical with perception and not transcending the senses; this is his guide in life and an absolute measure of truth. Leibniz accepts the natural light too, but neither as his guide, nor as an absolute measure of truth, nor as identical with the senses. It transcends the senses, it is innate ("une lumière née avec nous"), it is the basis of our knowledge of axioms and of the truths of reason generally, whereas the senses furnish only matter of fact truths. But he avoids the fallacy, derived by Descartes from his natural light, that "Les choses que nous concevons très clairement et très distinctement sont toutes vraies"; he replaces Descartes' "claire et distincte" by the rules of logic, and therefore his "natural light" is almost identical with "the force of consequence contained in our reasoning" or with "the sum of rules establishing this logical connection".[25] "La Raison est l'enchainement des vérités."[26] Again he adds, there is something beyond this natural light or beyond reason, the supernatural light or "la lumière revelée".[27] This dis-

[24] "Non est nobis finito intellectu praeditis, infinitarum varietatum distincta consideratio, qua tamen in rebus praesertim divinis comprehendendis persaepe opus foret" (*op. cit.* 62).

[25] Gerhardt, VI, 494 ff. [26] *Op. cit.* 49.

[27] *Op. cit.* 508; *cf.* for the critique of Descartes' *"claire et distincte"*, L. Couturat, *La Logique de Leibniz*, 193 ff., and 203.

cussion comes to an end in Leibniz's *Théodicée* which may be added to the anti-Tolandian bibliography; for it contains Leibniz's counterstroke against the freethinkers of his age, among whom was, besides Bayle, Toland (Part I,A, §60).

Leibniz attacks secondly Toland's one-sided empiricism. Here he continues his discussion with Locke and repeats his famous dictum, *nihil est in intellectu quod non antea fuerit in sensu nisi intellectus ipse* (which forms the starting-point of Kant's Critique in this form, "There is no doubt that all our knowledge starts with experience, but it is not therefore derived from it"). This implies that our intellect cannot function without sense data, but its acts and notions, far from being derived from them, are independent of them, *i.e., a priori;* that is to say, they formulate specific rules about the connection of propositions. Leibniz starts with the interesting remark that sense qualities are really *qualitates occultae.* We apprehend them, but do not comprehend them. Sensible objects which we believe we know best, we really know least. These paradoxical statements follow from his definition of knowledge as a complete analysis of propositions into primary notions. They are true in a deeper sense. We know what we mean by calling a color "red", we can identify it or explain it physically or physiologically; but the sensible quality as such we merely perceive but do not "comprehend". The same is true of sensible objects; the statements which we are able to make about them are at best "truths of fact" which never exhaust the indefinite aspects of the individual case. If we want to "comprehend" sense perceptions and to make precise statements about them, then, according to Leibniz, we have to transcend the single sense and to apply notions which are more distinct and which belong to the *sensus communis,* like number and figure. These mathematical notions are essentially rules; *e.g.,* algebra is essentially a rule; Leibniz's *Characteristica Generalis* and his *Logic* are systems of rules; the *Logic* develops *Regulae consequentiarum.*[28] Leibniz's thesis, that there is something beyond the senses, means therefore that in interpreting sense data we have to

[28] The *Opuscules et Fragments Inédits de Leibniz,* ed. by L. Couturat, Paris, 1903, illustrate the important role which the notion of *regula* plays in his thought; *cf.* 70, and *passim.* Algebra is, according to the algebraists of the Renaissance. *Ars certis legibus et praeceptis contenta, i.e.,* a *Regula.* (P. Boutroux, *L'idéal scientifique des Mathématiciens,* 85.)

presuppose the rules of logic and of mathematics. The senses can tell us merely what is, but not "what is necessary and what cannot be otherwise". If we want to know this we have to go beyond the senses, to truths of reason. Here again some of the central ideas of Kant's *Critique* are anticipated.

Leibniz attacks, thirdly, Toland's materialism which was at this stage purely mechanistic, matter being defined by extension and impenetrability. Toland defends a kind of materialistic theory of self-consciousness and of the Self; that we do not know the soul by itself, but merely through the body, and consequently through the senses and through sensible objects; that the Self is nothing but the result of the impressions which sensible objects make on the brain; and that our force of reasoning grows with the number of objects and persons whom we meet (this is almost a piece of autobiography). All this presupposes an interpretation of matter as purely passive; how otherwise would it be possible to accept the Self, the source of activity, as mere impression? Leibniz objects that this materialism (essentially identical with that of Hobbes and even with that of Epicurus and Lucretius, if their atoms and vacuum are discarded) is unable to explain the origin of action, of perception, and of order. The cause of all three of them must be sought *beyond* matter, that is beyond what is merely passive and indifferent to movement. He contends that the principles of mechanics cannot be explained mechanically. This leads to Leibniz's theory of matter, which because of its importance must be discussed separately. A materialistic position always implies a theory of matter; but a theory of matter is independent of the materialistic or anti-materialistic consequences which may be derived from it. Leibniz's theory of matter is anti-materialistic and one of his chief weapons for combating materialism. At this point it may suffice to say that his position forms the antithesis to Toland's: if the latter stresses the passivity of matter and mind, Leibniz underlines the activity of mind and matter. He is certainly right in denying the possibility of explaining sense-perception and the phenomena of the mind generally on the basis of materialism, and in rejecting Toland's "impression" theory of the Self.

He agrees that the soul cannot develop without the body. He even adds that no impression in matter is ever lost, and develops

his topical theory that we have subconscious perceptions which gradually become conscious. Without formulating it he defends the thesis, *Nihil est in anima quod non antea fuerit in corpore (sive quod non est simul in corpore) nisi anima ipsa.* Nothing is in the soul that was not before in the body, for if the body were not stimulated no impression would arise and the soul would be without material. Nothing is in the soul that is not simultaneously in the body; this is the parallelism of soul and body expressed here by the famous pre-established harmony. Leibniz seems to be right, as against Toland, in so far as he maintains that the phenomena of soul and mind are *sui generis* and irreducible to material processes, and that it is impossible to resolve the Self into a sum of impressions. His pre-established harmony is, however, an artificial and superfluous device which has to be replaced by the interdependence of the two sets of phenomena which we call those of the soul and of the body.

The discussion about Toland's materialism remains somewhat inconclusive, because of Toland's evasive attitude.[29] He concludes his defence of empiricism and materialism against Leibniz by saying that, in face of the rare genius of Her Majesty, he would be prepared to contradict himself and to defend the intellect against the senses. Leibniz hoped to enlist him in his fight against materialism which, he feared, might eventually destroy reason, the immortality of the soul, and the idea of God. He explained to him the principles of dynamics and pressed for further elucidations of his standpoint. Toland, however, evaded the issue; he would not or could not answer Leibniz's objections, whence Leibniz concluded: "Tout cela me fait juger qu'il ne se soucie guère de la vérité et qu'il veut seulement se distinguer par la nouveauté et par la singularité. Car quand on aime la vérité et a du loisir, on entre volontiers dans une discussion exacte."[30] But in spite of that, this discussion had a considerable influence on Toland in transforming his mechanistic materialism into a more dynamic form. Already in his *Annotatiunculae* Leibniz had drawn Toland's attention to the fact that Locke, who in his *Essay* had explained matter through

[29] *Cf.* Gerhardt, VI, 485 for a letter, dated Berlin, 14.1.1703, which contains a critique of Leibniz and may have been written by Toland.
[30] Gerhardt, VI, 520.

solidity, extension and their modes, in his correspondence with Stillingfleet admitted, under the influence of Newton, dynamic forces of attraction as essential to matter. This was a lesson which Toland accepted.

IV

That there is something beyond reason, and that there is something beyond the senses—these two theses offer no special difficulty. It is different with the third one, that there is something beyond matter. For it does not simply postulate the existence of mind. It implies much more, namely a specific analysis of matter according to which there is in matter itself something beyond the senses; therefore a critique of former theories of matter; and a very serious attempt to lay the foundations of a new science of Dynamics, together with a metaphysical interpretation of the new notions. We shall see that these problems are of more than merely historical interest.

The problem of matter is one of the thorniest and trickiest for the human mind, because matter signifies something which is just the opposite of mind and which resists not only all our movements and actions, but also all attempts to annihilate it either in fact or in thought. It does not help in the least to deny the existence of matter, or to declare this problem to be a pseudo-problem. Berkeley tried it, but he deprived thereby his "ideas of sense" of their very basis, for they arise merely as a response to material stimuli; a fact which can be experimentally confirmed. The still unwritten, but badly needed, history of this problem is extremely interesting. It reveals that the human mind found it easier to develop a rational theory of solid matter, which offers itself to a tactual and optical approach, and which was capable of an atomistic interpretation, than of fluid and gaseous matter, which involved the problem of the continuum. Man tried at the same time to generalise the problem, by understanding "matter" as any sort of material in any sphere of human activity. The result is that we possess many theories which partly refer to different objects or which, though they concentrate on "physical matter", imply elements from other theories. Broadly speaking these types of theories of matter may be distinguished:

I. Metaphysical Theories, like Materialism, which takes matter as absolute and makes soul and mind its epiphenomena; or Plato's identification of matter with the ἄπειρον, with the μὴ ὄν, or space as something which has no qualities.

II. Logical Theories, like that of Bertrand Russell, for whom a piece of matter is a logical structure composed of events, the causal laws of the events concerned and the abstract logical properties of their spatio-temporal relations being more or less known, whereas their intrinsic character is not known. (There is no room here to discuss the strange meaning of "logical structure". Is it to be interpreted as "logical construction out of sense data" in the sense of Berkeley's phenomenalism? In this case the theory would be epistemological rather than logical. But the expression "causal laws of the events concerned" seems to demand a realist interpretation.)

III. Epistemological theories, like Kant's theory in the *Critique of Pure Reason*, not that of the *Metaphysische Anfangsgründe;* for he postulates that phenomena, which are entitled to be interpreted as objects, must contain matter in the sense of a permanent substance which undergoes changes (*First Analogy*). Matter is here postulated as a necessary condition for our knowledge of objects.

IV. Mathematical theories, of the Pythagorean type, which may be illustrated by Plato's attempt in the *Timaeus* to construct matter out of triangles and regular bodies; or of the Cartesian type in which matter is identified with extension, figure and impenetrability being reduced to modes of extension in which movement separates the elements.

V. Biological theories, which take organic matter as the prototype of every sort of matter, even of that of inorganic nature, like those of Anaxagoras, of Fracastoro and Cardanus.

Though all these theories aim at explaining physical matter, it is important to note that up to now three fundamentally different theories of physical matter have been developed, namely

I. The substance theory. This defines matter by solidity, impenetrability, and rigidity; takes the volume of space, filled by it, as the measure of matter; assumes an atomic structure and adds hypotheses about the shape and the position of atoms with the help of which it formulates laws of motion and tries to explain the variety of phenomena.

II. The field theory, according to which a particle of matter, like an electron, is merely a small region of an electromagnetic field which is the centre of energy but by no means sharply separated from the surrounding field.

III. The dynamical theory. Here the substantial qualities of matter are replaced by its dynamic qualities. Movement is no longer interpreted as a mere change of position, but as endowed with a specific dynamic intensity, which is called impulse or *impetus*. This impulse is regarded as more fundamental than the mass of a body which is defined by Galileo as the constant relation between impulse and velocity.

It is this dynamical theory which Leibniz brought to a specific perfection. "There is something beyond matter"; this thesis implies first of all a rejection of the Mathematical and Substance Theories of matter. Matter is more than extension, and therefore Descartes was wrong in identifying the two. Leibniz's proof of this fact is of primary importance; for it implies the impossibility of reducing physics to mathematics. From the fact that physics may be written in mathematical language it does not follow that physics is mathematics; just as from the fact that mathematics may be written in logical language it does not follow that mathematics is logic, derivable from logical principles through logical principles. In both cases there is something "irreducible" though it is more difficult to formulate this irreducible element in the second case. For physics Leibniz determines it as "force" or "energy". Bodies are material not because they are extended but because they offer, in the first instance, "resistance" to any attempt at moving them. They have, further, other dynamical qualities, as *e.g.*, that they cannot communicate their motion to other bodies without loss of energy. In other words, there are certain dynamical laws, like that of the conservation of energy, which distinguish matter from mere extension. This amounts to saying that extension is not a primary quality. In this point Berkeley and Hume are in agreement with Leibniz. But he goes further by deriving extension from more fundamental notions like repetition, plurality, continuity or coexistence of parts. We would say today that he understands extension to be the field of the expansion of energy. This explanation of physical extension is coupled with an analysis of geometrical extension. The phrase "beyond matter" means, here, that even if we want to understand geometrical extension we have to go beyond the senses or beyond "imagination", that is beyond geometry in the classical sense, to arithmetic. Geometry is subordinated to arithmetic because in geometrical extension repetition and manifold are contained as constructive elements (*in extensione repetitio est seu multitudo;* Gerhardt, IV, 395). We would say today that extension may be interpreted as a point-manifold. Here Leibniz is in accordance with the development of modern geometry which was inaugurated by Descartes' Analytic Geometry.

"There is something beyond matter, as understood by the atomistic substance theory"—this is the second negative implication of Leibniz's thesis. Neither solidity, nor impenetrability, nor rigidity characterize matter as such. To assume that they do, means to accept the illusions of the senses or to take solid matter as absolute and to neglect completely fluid and gaseous matter. Solidity, impenetrability and rigidity are merely relative notions, because the same bodies may be regarded, from another point of view, as fluid, soft, and flexible. This is one of the reasons for his rejection of the atomistic theory.

The two just mentioned negative theses may be summed up in the positive proposition, that matter implies beyond extension and the relative qualities of impenetrability and rigidity force, *vis.*, or τὸ δυναμικόν, *i.e.*, energy. This δύναμις (*potentia*) is, as passive, the force by which a body resists motion; as active it involves a *conatum seu tendentiam ad actionem* in such a manner that the action is realized if no external cause hinders it. This force, or potential energy, represents the *materia prima;* the *materia secunda,* or the sum of the traditional characters of matter, is merely a *phenomenon bene fundatum,* and therefore material substances are nothing outside perception.[31] All material qualities of bodies are derivations from forces.[32] What is real in motion is the moving force and not the change of position; the body is equivalent to the sum of efficient points. This moving force is called substance, *i.e.*, a being capable of action. That is to say, the theses that there is something beyond matter implies lastly that in the analysis of matter we have got to go on to elements which are strictly correlative to what we call mind or spirit, that is, to active forces; or in other words that Dynamics is subordinated to Metaphysics. We can neither go into the intricacies of Leibniz's terminology nor enter into a discussion of this subordination which has not been accepted by modern science. But it is interesting to observe how man constructs "nature" in his own image and how, nevertheless, the resulting picture admits of a purely scientific interpretation. It is remarkable to note that so competent a scientist as H. Weyl

[31] Gerhardt, III, 623; *Math. Schrift.* VI, 234 ff.
[32] Gerhardt, IV, 400.

concludes his study of the problem of matter with the remark, that the General Theory of Relativity confirms in a surprising manner Leibniz's dynamical theory, in so far as matter may now be defined as an agent which causes a field (*felderregendes Agens*).[33]

The philosophical implications of Leibniz's theory of matter, especially of his critique of Descartes and of the notion of extension, do not seem to have been generally realized. Otherwise it would not have been possible to declare space-time to be the stuff of the Universe. Whatever space-time may be, this they are not. Professor Alexander once remarked in his modest manner: "I am well content if they inscribe on my cinerary urn *"Erravit cum Spinoza"*; he would certainly not mind if we add: *"et cum Cartesio"*.

V

Whereas Leibniz develops a dynamical theory, and rejects a substance theory of matter in its ordinary or atomistic interpretation, and admits substance merely as force or energy, Toland mixes the above-named three theories of physical matter and underlines that motion (not energy) is essential to matter. His central thesis is, that matter is active as well as extended and solid. Not one of these three elements and of the three corresponding theories alone is regarded as sufficient. Atomism is rejected; no parts of matter are tied to any one figure or form, losing and changing their figure continually as well as their physical condition which may be solid, liquid or gaseous. Not interested in the science of Dynamics, he mixes at the same time physics and metaphysics, and sketches rather a materialistic *Weltanschauung* than a theory of matter. In outlining this he combined what Leibniz clearly distinguished, a theory of concrete motion and a theory of abstract motion. Leibniz's somewhat abstruse theory of concrete motion, developed in his *Hypothesis Physica Nova* (1671), postulated for the explanation of the phenomena of the Universe one unique universal motion, namely a circular movement of the ether arising from the influence of the light on it. Toland correspondingly adds to the three characteristics of matter, that it is infinite in extension

[33] H. Weyl, *Was ist Materie?*, Berlin, 1924. A competent, up-to-date sketch of the theories of physical matter, with real understanding of their philosophical implications. *Cf.* further C. G. Darwin, *New Conceptions of Matter.* 1931; Louis de Broglie, *Matter and Light,* 1939.

and motion, and that there is *one* motion in the Universe. Action, interpreted as the motion of the whole Universe, is essential to matter; it is the real subject of all modifications, like local motions, changes and diversities. Absolute rest nowhere exists, and rest, as the remaining of the body at one place, is a real action.

Rest and motion, like action and passion, are merely relative. "Every motion is as well a passion in respect of the body that gave it the last determination, as it is an action compared to the body that it determines next. But the turning of these and such words from a relative to an absolute signification, has occasioned most of the errors and disputes on this subject" (200). This he has learnt from Newton.

When he adds that "the determinations of motion in the parts of solid extended matter, are what we call the phenomena of nature" and that we, not always appropriately, give names to them, according as they affect our senses, it is clear that in all this "Dynamism" his old Mechanistic Materialism is still paramount. Indeed, he accepts it in the form "that all the phenomena of nature must be explained by motion, by the actions of all things on one another, according to mechanical principles" (200). The expression "all phenomena of nature" comprises primary and secondary qualities, physical bodies, plants, "animal machines", and men. All movements and actions of organic bodies are to be mechanically interpreted, thought is merely an epiphenomenon. Nevertheless he does not exclude "a pure spirit or immaterial being", though it is not easy to see what rôle a spirit could play in this mechanistic world. The great weakness of this standpoint is revealed, when the question, what is motion, finds no other answer than, "a self-evident simple idea like solidity and extension".

It is all in all a standpoint of "Immanentism" which rejects the three theses of Leibniz's "Transcendentism", and which accepts the thesis that there is something beyond the senses, merely in the sense in which it formed the basis of Democritus' theory. This "Immanentism" is essentially a Materialism which leaves room for a pantheistic interpretation adopted later on by Toland, and this Materialism remains at bottom mechanistic. It differs however from the old mechanistic atomism by its rejection of atoms and by its acceptance of elements of the dynamical theory. These new ele-

ments, negative as well as positive, are clearly influenced by Leibniz. The *Letters to Serena* are the outcome and the continuation of the discussions with the Berlin circle.

Like Leibniz, Toland rejects Descartes' identification of matter and extension and Newton's theory of space. Far from being real or absolute, "space is only an abstracted notion or the relation that anything has to other beings, at a distance from it, without any consideration of what lies between them though they have at the same time a real existence" (180). Following the mathematicians' habit of positing space without matter, points without quantity etc., philosophers imagined a real space distinct from matter, which they held to be extended, incorporeal, immovable, homogeneous, indivisible, and infinite. Though he is right in rejecting Newton's absolute space, his own concept remains obscure and undefined. He says, "Thus place is either the relative position of a thing with respect to circumambient bodies, or the room it fills with its own bulk, and from which it is conceived to exclude all other bodies, which are but mere abstractions, the capacity nothing differing from the body contained; and so distance is the measure between any two bodies, without regard to the things whose extension is so measured" (180). These somewhat crude words seem to reflect a certain knowledge of a fundamental distinction between topological and metrical space, which was not unknown to Leibniz, and which is based on the notions of "surroundings" and "distance" respectively. (Topological space may be defined as a manifold E, in which to the elements (points) certain part-manifolds U_x correspond which are called surroundings of x and which fulfill the conditions expressed in certain axioms. Metrical space may be defined as a manifold E, in which to every set of two elements (points) x,y a not-negative number, their distance $xy \geqq o$, corresponds, and which fulfill the conditions of specific axioms of distance).[34]

All these theses—that action is essential to matter,[35] that matter cannot be defined by extension,[36] that neither absolute space[37] nor

[34] F. Hausdorff, *Grundzüge der Mengenlehre*, 1914, 211 ff.

[35] Gerhardt, L.c., V, 46, "Je soutiens que naturellement une substance ne sauroit être sans action, et qu'il n'y a même jamais de corps sans mouvement!" "Agere est character substantiarum" (*Acta Eruditorum*, ad Ann. 1695, 145).

[36] Gerhardt, IV, 464 ff.; II, 71.

[37] *Cf.* Russell, *The Philosophy of Leibniz*, 249.

absolute rest[38] nor any void[39] exists, that space is order rather than container,[40] that the essential action of matter is identical with the *vis motrix* and the *conatus ad motum*[41]—are derived from Leibniz. Toland himself is quite aware of this fact. For he concludes his book by referring to "our common friend who alone philosophizes at court, and who exceeds all the rest in politeness and address, as much as he does in wisdom and literature, his superior genius and his admirable sense no less distinguishing him in ordinary ceremonies, than in the nicest and most arduous points of state affairs" (p. 238).

But despite his dependence on Leibniz, Toland remains fundamentally himself. Both reach a standpoint which may be called pan-dynamism. Toland formulates it thus: "As those particular or limited quantities which we call such or such bodies, are but several modifications of the general extension of matter in which they are all contained, and which they neither increase nor diminish: so (as an adequate parallel) all the particular or local motions of matter are but the several determinations of its general action, directing it this or that way, by these or those causes, in this or that manner, without giving it any augmentation or diminution" (176). In saying so he seems to confuse two different ideas, the legitimate laws (or rather hypotheses) of the conservation of matter and of energy, on the one hand, and the false assumption that all kinds of motion are but modifications of one basic action, on the other; or two theories, namely those of concrete and of abstract motion. Leibniz's pan-dynamism is rather pan-activism. He tries to bridge the gulf between matter and mind by interpreting matter *sub specie mentis*. His thesis is that the same active force (*agendi virtus*) is inherent in any substance leading always to action; and that corporeal substance as well as spiritual substance never ceases to act. This active force in mind and matter is the same; and the different levels of the Universe are therefore completely homogeneous. Toland, on the contrary, instead of elevating

[38] "Corpus omnimodo quiescens a rerum natura abhorreri arbitror" (*Acta Eruditorum*, 1695, 146).
[39] Gerhardt, VII, 372.
[40] Gerhardt, V, 115. "En effet le temps et le lieu ne sont que des espèces d'ordre".
[41] *Acta Eruditorum*, 1698, 434; *Math. Schrift.*, VI, 66 ff.; Gerhardt, IV, 393 ff.

matter to the level of mind, reduces mind to that of matter. The one Divine Universe has dissolved to such an extent that the one Divine Being is replaced by the one motion. Toland's pan-dynamism is in fact pan-materialism, and has influenced materialistic thought. Baron Holbach translated the *Letters to Serena;* continued his fight against prejudice in his *Essai sur les Préjugés,* 1770; and incorporated some of his ideas, especially the theory of motion, in his *Système de la Nature,* 1770, a book which helped to prepare the way for the French Revolution.[42]

Has Toland's theory of matter more than merely historical interest? One may feel inclined to answer, "No, he was a mere eclectic who took one element, extension, from the mathematical theory, one, impenetrability, from the substance theory, and one, motion or action, from the dynamical theory". But it would be fairer to understand him as saying that matter may be interpreted under the different aspects of these three theories; and, indeed, he asserts that these characters express merely different perspectives of the same phenomenon. We should do well not to condemn such a standpoint *a limine,* seeing that some recent theories in atomic physics interpret the same equations under the different aspects of waves and of particles.

VI

Our conclusions are therefore these. 1. By translating Leibniz's terms into materialistic language Toland reaches his own standpoint which may be described as *Dynamic Materialism.* 2. This *Dynamic Materialism* stands in the same relation to Hobbes' Mechanistic Materialism, as Leibniz's Dynamism or Activism stands to Descartes' mechanistic interpretation of nature and man. To be sure, matter *and* motion were always the cornerstone of Materialism, from the times of Democritus to Gassendi and Hobbes; but, "Matter *is* Motion or Action", is Toland's new thesis. 3. Toland's Dynamic Materialism is a forerunner of Marx's

[42] It may be worth while to re-examine the possible influence of Leibniz on Shaftesbury, Bolingbroke, Pope, and generally on English philosophy until Hume. A. Bacharach, *Shaftesbury's Optimismus und sein Verhältnis zum Leibnizschen,* Strassburg, 1912, is in spite of valuable material not convincing in its negative result. For Hume *cf.* my pamphlet, *David Hume, The Man and his Science of Man,* Hermann & Cie, Paris, 1940.

Dialectical Materialism. Both of them connect motion and action with matter; and both use this connection for revolutionary ends. Toland has by no means the same importance for the French Revolution as Marx has for the Russian Revolution; nevertheless he inaugurated a trend of thought which gathered strength during the eighteenth century and which contributed to the final explosion. 4. Toland stands in a relation to Leibniz like that in which Marx stands to Hegel. Both translate the spiritual and idealistic language of their masters into materialistic expressions and by doing so change profoundly their meaning. Since Leibniz's Dynamism refers primarily to nature, Toland's dynamic materialism is naturalistic too, whereas Hegel and Marx start from History. 5. From this it follows that we should not overrate the differences of standpoint, either philosophically or sociologically. Leibniz and Hegel were both conservatives and defended the ruling aristocracy; nevertheless their ideas were used (or abused) by the revolutionary bourgeoisie or the revolutionary proletariat. Both were idealists, and despite that their ideas served for a materialistic interpretation of the Universe. I do not want to use this fact for illustrating the old truth "Les extrêmes se touchent" or the *Coincidentia Oppositorum*. But the point should be stressed that those are utterly mistaken who regard the doctrine of the relativity of standpoints as *the* result of history, and who say that no other possibility for philosophising is left to us except studying the different types of past philosophy (Dilthey). Surely, there are different perspectives. They are, however, interdependent and, paradoxically, just because they depend on so many factors (personal, sociological, biological, psychological, historical, etc.), these different dependencies which lead in every case to the overstressing of one aspect, counterbalance and eliminate themselves in the course of time.

This is the reason why the history of the human mind, this perpetual dialogue between persons, groups, and standpoints, or between man and man, man and the universe, and man and God, shows, notwithstanding the variety of perspectives, a remarkable coherence.

F. H. HEINEMANN

OXFORD

KNOWLEDGE BY DESCRIPTION

IN A previous paper I offered a study of the general character of knowledge by acquaintance. I wish now to present some ideas concerning the contrasting mode of cognition—knowledge by description. I shall use Russell's treatment of the subject as a sort of tonic or keynote, as I did then, without however being tied too closely to his development of the theme. Since I shall try to show that knowledge by description is dependent on knowledge by acquaintance (as Russell also maintained, although for very different reasons) I shall have to begin by presupposing the truth of certain statements which I sought to prove in my earlier discussion: these I may summarize as follows:—(1) All knowledge by acquaintance is conceptual in character, like other knowledge. (2) Its content—the *what* asserted—is therefore always generic, since every concept is generic. (3) It may be, nevertheless, knowledge of individuals, when the concepts employed are applied to given concrete items, which then become the *that* which is known, even though *what* is known about them is generic. As one of my friends commented in reading my discussion, in knowledge by acquaintance we 'scrute the inscrutable', which as 'scruted', ceases to be, thus far, inscrutable. (4) The essential differentia of this mode of cognition is the presence or givenness to and into the concepts used of whatever is described and known by them, as a hand fits into a glove. Knowledge by acquaintance is, in sum, descriptive, even as knowledge by description is.[1]

However, in the case of knowledge by description, that which is described is not given or present to and into the concepts by means of which it may be known: it is as if the glove were there, but the hand had been removed. Nevertheless, it also may be knowledge of individual items; and in this paper I shall confine my analysis entirely to knowledge of objects of this kind, neglecting the possibility of knowing by description universals, such as Circularity or Betweenness, or general facts, such as 'All men are mortal' or 'Some Indians live in Michigan'. Moreover, the in-

[1] The phrases 'by description' and 'by acquaintance' are, therefore, inept, yet I shall employ them in this article out of deference to current usage. It would be an improvement if we could substitute 'merely by description' for 'by description'.

dividuals known by description either exist or did exist; hence historical propositions come within the scope of our investigation. Finally, since that which is known is not given, the whole content of descriptive judgments would appear to consist of concepts, whereas in knowledge by acquaintance, since the subject (or object) is given, the content of the proposition asserted contains the subject as a constituent, which is usually not a concept, but may be a sense datum, an activity of the self, the self itself, or God (if there is a God and if God is immanent).

The foregoing points concerning knowledge by description (although not concerning knowledge by acquaintance) are, I believe, in fundamental agreement with Russell's views as expressed in the classic article, "Knowledge by Acquaintance and Knowledge by Description", re-published in *Mysticism and Logic*. There Russell called attention to the fact that we often know much about individuals whom we have never known by acquaintance, such as physical things, the minds of other persons, and historical events and personages. For example, I know that the late President of the United States was a Democrat; that he served for three terms; that his wife was named Eleanor, etc., although I never saw him. I know also that Caesar crossed the Rubicon; that he was born 102 B.C.; that he wrote *De Bello Gallico;* that he was assasinated by Brutus, etc., although, of course, I have not met him. Russell noticed, however, that in the usual statements of such knowledge, as in the illustrations given, the object known seems to be a constituent of the proposition, the President of the United States, Caesar. He believed, therefore, as is well known, that the statement should be so recast that this misconception would be eliminated. If then we translate 'The President of the United States is a Democrat' into 'X exists and x is President, and if y is president, x = y, and x is a Democrat', we get a sentence such that every constituent is the name of a concept, and none of an individual. As every element of knowledge by description is a concept, and the individual known is no part of the proposition through which it is known, we seem to have a statement that is word perfect for the purpose in hand. Moreover, it appears to tell accurately everything asserted in knowledge by description: (1) that the object of knowledge exists; (2) that this object is unique;

(3) that it has a certain character. There is, however, one obvious inadequacy—its failure to distinguish between 'exists' and 'did exist'; but this is a matter that will concern us in a special way later.

Yet I must confess that when I scrutinize Russell's formula I cannot avoid the impression of something as 'phony' as the 'phony war'—as if something were being put over on us. For how can we possibly get knowledge of an individual out of concepts each of which is generic? And also, how can we pass from bare concepts to existence unless we are prepared to accept something like an ontological argument? In knowledge by acquaintance, these questions do not arise, since the individual known is itself a constituent of the proposition and, as given, necessarily exists, as was shown in my earlier article referred to. The crucial elements of Russell's formula are obviously 'x exists ($\exists$ x)' and 'x = y', out of which, somehow, knowledge of existence and individuality are to spring. The problem is, however, obviously not dependent on Russell's formulation, and in its essential features is so old that one might with good reason wonder whether anything new could be said about it. Yet the last word has by no means been said, and we must study it anew if we are to obtain any further light on knowledge by description.

The solution of the problem depends, as it only could, on a freshened understanding of the nature of the concept itself. The ancient view that the concept has the *two* functions, connotative *and* denotative, must be retained. In other words, the primary function of the concept is to affirm, and also to reveal, existence. That this is true follows from the facts concerning the origin of the concept. Every concept is the joint product of the activity of the mind and the control of the environment,—the offspring of both parents. The concept "blue" is developed under the control of blue things; the concept "man" under the control of men. I experience myself as being determined to have the concepts that I do have; I no more freely choose them than I do the sounds I shall hear or the scents I shall smell. The existence of imagination, where elementary concepts are freely combined into new structures, misleads into an exaggerated view of the rôle of mental activity. But even in imagination the elements of the resulting complex are

not entirely voluntary products, and the demand for consistency and plausibility in fiction is a recognition of the continuing control of reality.

This view of the concept, that it is in effect a propositional function affirming existence, seems to be opposed to that of Stout and Langford,[2] who have held that the concept expresses not existence but possibility. Thus, whereas I should maintain that what the concept 'man' says is, 'There are men', they claim that it says 'There may be men'. Yet when their view is properly understood (although I fear my way of understanding it would be rejected by its protagonists), there is not as much difference as seems. For the real meaning of possibility, unless it means no more than lack of internal contradiction, is some degree of probability. For example, if I say 'There is a possibility that the war will be over by Christmas', I do not mean merely that the idea of the war's ending then is internally consistent; I mean that there is *some* probability of its ending then—that there are forces now operating making for an early conclusion of the war. So understood, the existential reference of the concept is retained. This interpretation represents the second intention, the more sophisticated or critical significance of the concept. For since concepts are sometimes found to be false, a general uncertainty attaches to all of them, so that, on reflection, the best that can be said of any one of them, is that there *may be* things of the kind in question; that is, that there are forces operating to produce such things; but which, of course, may be countervailed. Even so, however, it is clear that the change from "there are" to "there may be" preserves the existential reference of the concept: the existence of something is affirmed and revealed.

It would seem to follow that, properly, it should not be necessary to have a special term for the expression of existence; but, on the other hand, it would be necessary to express non-existence. When we do use terms that express existence, our purpose is, in effect, to correct a denial of non-existence, and our procedure is equivalent to the use of double negation. 'Men exist' says 'It is false that men do not exist', or more simply 'Men *do* exist'. There was a certain truth, therefore, in the ontological argument. The mere concept of

[2] C. I. Lewis and C. H. Langford, *Symbolic Logic*, pp. 471-476.

God lends to his existence some plausibility, but, of course, is hardly demonstrative. But every concept possesses this initial plausibility, and without it no concept could claim truth, as will be insisted strongly in the sequel.

The relation of the concept to existence is analogous to that of the sensation; and since the concept depends for its significance on the primary experience of things, it will throw light on the former if we consider this analogy. Philosophers in the past have sometimes conceived of the sensation as a self-contained entity, and have then been puzzled as to how through it we could have any knowledge of the external world. But the recognition is growing that it is a very different sort of thing, actually a point of contact with one's not-self, belonging therefore both to one's self and one's not-self, so that, in perception, we are, as Bergson said, *"dans les choses"*. That phenomenologically this is true, has always been recognized. The sensuous envelope of experience comes to us as *out there,* determined alike as to its existence and its quality by forces not-ourselves. Even when we do partially control its presence and its character, as occurs in voluntary action, and in all the various processes of human making, of the builder and the artist, the cooperation of external forces is required, as is shown by the simple facts of paralysis and the need for the adjustment of plans and purposes to what are called 'materials'. On the other hand, any critical examination reveals that the sensation belongs to one's own mind—that it is 'subjective'. There is, however, no contradiction between these two insights: that the sensation belongs to nature, as common sense sees, and that it belongs to the field of one's own experience, as science discerns; for whatever is at a boundary belongs to both contiguous areas. Even illusions confirm this point of view, for they do not forfeit their external reference, although their precise location is misinterpreted. The visual appearance of a man who sees himself in a mirror is as much under 'countercontrol' as is his appearance when he looks down at himself directly. In short the primary existence-revealing character of sensations remains intact, despite all errors and illusions of perception, because they are under the direct control of one's not-self—a control that is not a mere hypothesis or postulate of "animal faith", but a datum. Sensations are the words of a

'natural language' saying, as it were, 'There exists something not-yourselves of which we are the signs'. In analogous fashion, despite false judgment and creative imagination, the existence revealing function of concepts remains unimpaired. They are echoes of existence and witnesses to its continuing control. The mere having of a concept, like the mere having of a sensation, is an infallible token of the existence of a not-self, because in each case we experience its power over us.

But even when we have won this insight we have taken only the first step towards understanding how the concept can know. In order to take the next step we must enquire more narrowly into the nature of the concept.

The simplest theory of the concept would be that it is a mere word—a doctrine that can claim ancient authority in the linguistic identity of thought and word. Today we encounter a revival of the theory in the frequent substitution of the sentence for the proposition, and the general identification of the "syntax of language" with logic. Yet there are elementary and decisive reasons against the theory, which have often been pressed. Among these is the fact of translation: many sentences with the same meaning. It is true that one can readily seek to nullify the weight of this fact by identifying sameness of meaning with the class of equivalent sentences, much as one can define number as the class of similar classes; yet the difficulty remains of defining the equivalence of sentences apart from identity of meaning. Of course if one has recognized sameness of meaning as a fact, one can then go on to define sentences as equivalent, and find it convenient to use the sentence (or the word) as a substitute for the meaning. Behavioristically speaking, anyone of a number of stimuli may act as the signal for the same type of reaction, and may therefore be substituted for any other; but readiness to react in this way *is* the meaning, with which no one of the signals for it can be identified. But the clearest proof of the impossibility of identifying concept and word is the phenomenological difference between a word *per se* and a word understood. It is one experience for a person to hear or see a word of a language he does not understand; and another experience to see or hear it after he has learned the language. The difference is the meaning, and our problem now becomes that of

discovering what sort of thing the experience of meaning, of understanding a word or a sentence or other sign is.

In my earlier paper already referred to, which in some ways is introductory to the present one, I distinguished three functions of the concept, as follows: (1) the aesthetic function, its service as a 'lure for feeling'; (2) its pragmatic function, to operate as a plan of action; (3) its cognitive function, that of being a substitute for, and unifier of, primary experience. No one would doubt, I suppose, that much can be learned about the nature of the concept by studying its functions. We need not delay over the first function, except to remark that, for the total philosophy of the concept Whitehead performed an inestimable service in placing this function in evidence. But its importance belongs clearly more to aesthetics and ethics, where its full significance is just beginning to be recognized, than to epistemology.

We cannot, however, pass so rapidly over the pragmatic function of the concept, because of the identification by the pragmatists of cognition with it. And it must be admitted that many concepts serve as plans of action; all concepts of objects of utility afford easy examples: 'chair'—something to sit on; 'door handle'—something to grasp and turn; little would remain of such concepts if we were to eliminate the plan of action. That there is a plan embedded in other, less obvious examples is easy to see. The concept of a city is, or at least contains, a plan for finding one's way about; that of a geographic region, such as 'New York State', for getting from one place to another. To be sure, even in the first cases, the concept includes certain purely sensuous, especially visual properties, as the look and feel of the doorknob, that cannot be resolved into plans of action.

Moreover, there are types of concepts that are certainly not plans, at least in the ordinary sense; for example, concepts of sense qualities, like 'blue', 'soft', 'c♯'; of past events and persons, like 'The first battle of the Marne' or 'Foch'. It is true that the latter are concepts of activities, but they are of activities that cannot be carried out, since they do not exist and cannot be renewed. We find concepts of this type in the aesthetic experience. In looking at a still life picture, we may interpret a certain colored patch by means of the concept 'cup', which, in effect, says to us 'Drink

from me'; but, since the cup is imaginary, the invitation to action is ineffective, hence, pragmatically speaking, is no plan. Still, since the essential nature of reality, excluding its sensuous surface, is activity, every concept of a thing is a kind of plan, provided one regards impossible and aborted designs for action as plans.

Nevertheless, although we have conceded much to the pragmatists, the theory of the concept I would defend is not theirs. For them, a concept is a plan for *my* action with regard to a thing, while I should hold that it includes the plan of action of the thing itself—its own inner plan. So, my concept "Foch" is not so much my plan with reference to the general—although that is included, for he is, let us say, 'somebody to be celebrated by me'—as the echo in my mind of his plan, now dead, for himself; and since he no longer exists, how could it be otherwise? Only in the case of artifacts is the concept dominantly my plan with reference to them, but even in their case, it includes their plans with regard to me—their kickback, so to speak, against my action upon them.[3]

Yet there is one function common to all types of concepts, namely, that they act as substitutes, by giving us an aftertaste or foretaste, an echo or premonition, of what they mean. This, to be sure, is not fully contained in the mere 'understanding' of any sign. What is there is a state of mind that can best be described as a 'readiness' or 'potentiality' which is nevertheless a very real experience, with unique quality, that may be developed into, actualized into, the echo or premonition.

In order to comprehend how this is so, we must to a certain extent repeat, and at the same time expand the line of thought begun in a previous article. As was stated there, every concept has a base. A base consists of a primary experience, or primary experiences, from which a concept has been derived, and of which images may be aroused. Every concept is the starting point for a throng of images. In this regard, the concept, like the Platonic Idea, is reminiscence, *Anamnesis*. In the case of a concept to which no primary experience or memory corresponds, as "sea serpent", an imagination is the base. It must be emphasized, however, that

[3] One might call the view of the concept expressed in this paragraph disinterested pragmatism, in contrast with the usual type of pragmatism, which is utilitarian.

anyone or several of a group of primary experiences may serve as the base of a concept, which may be associated with a variety of images, since every concept is general or generic. Thus my concept 'tree' may have as base a pine tree experience or an oak tree experience.

Now the relation of a concept to its base is as follows: the concept represents a readiness to interpret an object in terms of its base. It is an anticipation of an object such as This, where This is something given or remembered or imagined like the primary experiences from which the concept has been derived, and which may now serve as a new base. On the one hand, the concept contains a tendency to return to its original base through images or memories, or by finding something like it; on the other hand, it is a potentiality to move away from its base and look for new objects that may be assimilated to its base. In this way it resembles life itself, in being a leap from a past to a future; and this vital leap is irreducible.

The conclusions so far drawn concerning the nature of the concept can be expressed by means of certain phrases, which are equivalent, I believe, to the meaning of any word that names a concept. Let us choose as illustration the simplest possible concept, say 'blue'. We shall then say that 'blue' is equivalent to 'there is something that is blue', or more cautiously, 'There is something that may be blue.' This phrase expresses the essential existential reference of the concept, its covert ontological argument. In symbols, $\exists x . \Delta F(x)$. Here 'Δ' means possibility in the sense already explained, as 'probable in some degree', which is not the same, I suspect, as the meaning assigned by Lewis and Langford in their *Symbolic Logic*. Notice that, if this formula is correct, every concept, like every sensation, asserts the existence of something, and also that it may have a certain character: the assertion of existence is categorical—only the assertion of its character is problematical. Second, 'blue' means 'such as This', where 'This' is the base of the concept—something given as blue in primary experience or something so remembered or imagined. Or, more accurately, since there are always alternative bases, 'such as This or such as something such as This'. Putting the two expressions together we have 'blue' equals 'There is something and something may be such as This

or such as something such as This'. The judgment 'The sky is blue' would therefore be equivalent to (using 'x' as the common symbol for 'something'): "There is an x, and x is identical with the sky, and x is something such as, for example, this visual patch in my field of vision, or something such as This". The concept is an expectation of something such as something in primary experience, memory or imagination.

There are however two objections that may be urged against the foregoing theory of the concept: (1) that it leads either to an infinite regress or to an exceptional status for the concept 'similar'; (2) that it makes all concepts vague. Let us consider (1) first. Then if 'blue' means 'such as This', then, assuming that 'such as' is equivalent to 'similar', 'similar' itself must mean 'similar to This', where 'This' would denote a situation where certain primary experiences (or images or memories) were found to be similar; but since, in order to formulate the meaning of 'similar', I have to use 'similar' again (similar 2), I shall be forced to find a base for 'similar 2' in the same way, employing 'similar' again (similar 3), and so on *ad infinitum*.

But the regress is, I think I can show, quite harmless, and the reason why this is not seen to be so, is owing to an important misunderstanding. In the first place, if I define say 'blue' as 'x similar to This', what I mean is, that if I were to find an object to which the concept applies, I would experience it as being similar to This. This similarity need not be known but only experienced or 'felt'; hence does not itself involve a concept. Consequently, the explication of 'blue' as 'x similar to This', while it uses the concept 'similar' to explicate a concept, does not base the meaning of the concept on a concept, but wholly on an experience. To understand 'blue' we need only to have this experience; nothing more is required. Of course, if we wish to explicate the concept 'similar' used in the explication of the concept 'blue', we must do so in the same fashion employed in the explication of 'blue'. 'Similar' means 'x similar to This', where 'This' denotes a base, a primary experience of (not knowledge of) the similarity of two given items. To repeat: while I use the concept 'similar 2' to explicate what I mean by the concept 'similar 1', I understand 'similar 1', not in terms of 'similar 2', but in terms of a primary experience or 'feeling' of

similarity. Moreover, 'similar 2' is a concept of higher order than 'similar 1'; and if I wish to define *it*, I must use a new concept 'similar 3', proceeding in the fashion already employed; but, again, I shall understand 'similar 2', not in terms of the concept 'similar 3', but in terms of an *experience* of the similarity of similar concrete situations. Hence there is no vicious regress here—although there is a procedure *ad infinitum;* nothing that is not strictly in accordance with the theory of types; and there is no circularity, since the concept 'similar' used in the definition of 'similar' is always of a different and higher type (indicated by the difference in the subscripts '1' and '2' in the foregoing discussion).

It is, as Russell has observed, profoundly significant that 'similar' plays so outstanding a rôle in the definition of concepts, and appears to be required as an element in any 'minimum vocabulary'. But there is nothing mysterious about this—at least nothing more mysterious than the fact that universals, and therefore classes, exist in some sense. It must be admitted also that the theory of the concept here defended makes all empirical concepts vague.[4] And it follows that even when they are made as precise as possible they remain generic: absolutely specific concepts are impossible.[5] But since they are facts, no theory of the concept can remedy these matters.

A very different theory of the concept is expressed in Russell's *Enquiry Into Meaning and Truth,* Chapters VI-VIII. According to this theory a concept is a name for quality. The given consists of qualities, and what we call things are bundles of them. Judgments of perception—that is to say judgments of acquaintance—are whole-part judgments saying that quality Q is part of whole W. It is supposed that qualities can recur, spatially and temporally. Russell admits that there are difficulties in the way of accepting this recurrence, but by means of ingenious devices he thinks they can be surmounted. In the Schilpp volume,[6] he appears to adhere to the same view. Any other view, such as the one I am espousing,

[4] See *The Philosophy of Bertrand Russell* (Schilpp Volume), p. 688, and the article in the same volume by R. M. Chisholm "Foundations of Empirical Knowledge", pp. 434-435. Also B. Russell *The Problems of Philosophy,* pp. 150-151.

[5] On these points see my earlier paper.

[6] *The Philosophy of Bertrand Russell,* pp. 714-716.

he believes to suffer from the difficulty of requiring the notion of substance, designated by 'This', in judgments of perception.

But there are, I believe, fatal objections to Russell's theory of the concept. Chief among them is the fact that in applying a concept, say 'blue' ('b'), we never do mean to *name* the unique color constituent of a given item (let us call this constituent b1), because we apply the concept to other color constituents equally unique and obviously different, such as b2. This dark blue patch is equally blue with that light blue patch; therefore 'blue' is not a name for either, since a name, on Russell's view, cannot apply to two different given items. The only escape from this argument would be to maintain that what 'b' names, that is to say b, is a recurrent yet unique constituent of both b1 and b2, which would themselves then be bundles of qualities, b1 resolvable into b + x, and b2 resolvable into b + y, x and y standing for, let us say, unique degrees of saturation and brightness, if b stands for a unique hue. Then x itself would be resolvable into (S + k1) + (I + l1), where 'S' would name saturation, 'I' intensity, and 'k1' and 'l1' degrees thereof, respectively; y would be resolvable into (S + k2) + (I + l2), where 'k2' and 'l2' would name other degrees of saturation and intensity, respectively. We would thus have:

$$b1 = b + S + k1 + I + l1$$
$$b2 = b + S + k2 + I + l2$$

From this it would follow that if we had enough names we could express without residue any portion of the given, as in the above example, where the letters function as names. The bald upshot of the view is the resolution of attributes into constituents.

However, this view of a quality falsifies its nature. A quality with attributes is not a whole with parts. The blueness, the intensity, the saturation pervade the whole quality, they are not elements that compose it. If they were, they could exist by themselves; we could conceivably have just blueness without intensity or saturation, or just intensity or saturation without blueness, or anyone of the three without any of the other two. Moreover, Russell admits that owing to the intransitivity of matching (see my earlier paper and Russell's *Enquiry*, pp. 129-130) we can never know that

our concepts do name anything unique. They are therefore inescapably vague, and consequently not names of unique, individual qualities. And if we cannot know that they are, it seems useless to assume that they are.

On the other hand, anyone who rejects Russell's view is not committed to accepting 'This' as naming something transcendental. He may even hold as I do,[7] that the given is composed of qualities. But qualities are unique, are never repeated and never recur; and although they have attributes, the latter are not resolvable into constituents; moreover, so far as they are unique, they are ineffable: concepts apply to them, but cannot exhaust their nature. 'This' names the unique quality, without describing or analyzing it. In the end, Russell's theory denies the existence of the unique, the ineffable. But there is no escape from the This. If that is regarded as a disadvantage, it is compensated for many times over by obviating the necessity of inventing, as Russell tries to do,[8] dubious local and temporal signs, by means of which moments and places are supposed to be defined; for both the now and the here can be defined in terms of the This, if the This is recognized as unique.

However, there is still another alternative to defining the concept in the way I have been defending: namely, to regard it as the name of a universal in the more old fashioned sense. And it must be said that there are concept words which seem to fit this view better than any other. If 'red' appears to refer to things that may be red, 'redness' appears to refer directly to what is common to such things. Corresponding to every concept that has both denotation and connotation, there is one which appears to have connotation only—one whose denotation *is* its connotation—which denotes what it connotes.

If one could accept this view it would, undoubtedly, simplify the theory of judgment in comparison with the one which I have been defending. But as it stands, taken *simpliciter*, it appears to presuppose a Platonic, realistic theory of universals for which there is no evidence—the theory of their independent existence. And, on the contrary, we find universals only as embodied in particulars.

[7] *Experience and Substance*, Ch. XI.
[8] *Enquiry*, pp. 122-126.

The very notion of existence implies individuality; for we can define universals and then ask whether there is any existence corresponding, which is the same as asking, what if any individuals embody them? To find redness I must find a red thing; to find circularity I must find something which is circular. In order to tell what I mean by circularity, I cannot point to the universal by itself, but only to individuals that embody it. To be sure I can find it by pointing to alternative individuals, but not without pointing to some individual. The base of the concept is an alternative base, but always an individual base. This does not mean that the universal is not real, but solely that it is not independently real; in other words, that it is real as a factor in individuals.[9]

If now we have correctly diagnosed the nature of the concept, insisting on its capacity to reveal existence, we are in a position to consider two further, closely related problems: (1) how the concept, although generic, can refer to a unique individual, and (2) how the concept can be true in the absence of its object.

The first problem is made acute through the fact that by itself the concept refers only to a variable or alternative individual. If this is so, how, in knowledge by description, which functions supposedly by means of concepts alone, can we denote a single unique individual? The problem does not arise in knowledge by acquaintance, for there the concept seizes hold of the very object it characterizes. We can, of course, continually narrow the range of application of the concept by adding further, limiting concepts to our description, but since all concepts are generic, we can never, through any number of concepts, however large, indicate the individual; for our new total concept might apply to some closely similar individual. We may make our conceptual net as fine and close-woven as we please, but the individual upon which we cast it may escape through its meshes. Even the specification that $x = y$, in Russell's analysis of definite descriptions, will not avail, since identity is itself a concept, and therefore, like every concept, generic; $x = y$ can never mean more than generically the same.

[9] In the foregoing discussion I believe that I have achieved a reconciliation of the nominalistic theory of judgment with a kind of Aristotelian recognition of the reality of generic universals. The reader will find another discussion along the same lines in my *Experience and Substance*, Chapter IV.

The Whitehead-Russell definition of the pure concept of identity is the sole possible one: $x = y. \equiv F\,(Fx \equiv Fy)$.[10] But if this is true, two things which according to this definition should be identical, might yet not be identical, for, since all concepts are generic, the last specificity of each, ineffable descriptively, would evade the definition. We seem therefore to come up against the strange paradox of two identities, one definable, the other indefinable. And who can doubt that we do distinguish things which, by reason of the definition, should be judged identical, as when we distinguish two twins we are looking at, although we can find no concept intrinsic to the one that does not apply to the other? Or who can doubt that we do mean uniqueness, even when we seemingly have to depend on descriptions, as when we mean *the* President of the United States, or apply any other definite description in the absence of its object? That we do so, is not in doubt; the only question is, how and by what right?

The answer to the question is given through the insight that identity is not a pure concept. We can see this most clearly if we consider its application in knowledge by acquaintance. Suppose that I see two pennies fresh from the mint, or, if you prefer, two pennyish shapes. Descriptively they are the same, or if there are descriptive differences, I cannot discern them; yet I know that they are not the same, for I can see that they are two. Here then we reach an impasse: according to the definition of identity, they are identical; yet I 'see' that they are not identical. Either the definition is insufficient or I am mistaken. Yet that there is a mistake is hard to believe; the full self-evidence of knowledge by acquaintance is in play. Hence they are not identical, and our analysis of the concept of identity is insufficient or wrong.

But the definition is clearly not *wrong*. If someone tries to pass himself off as the President of the United States, and we discover that he does not have a wife named Bess, or a daughter Mary, we know that he is not the President: $F\,(x) \equiv F\,(y)$. I can soon detect the imposture by applying the definition. For most practical purposes—and for most scientific ones—the definition is adequate. And it is adequate because the W.R. definition lays down a neces-

[10] *Principia Mathematica*, 13.01, 13.11.

sary condition of identity, and usually, if I know that that condition is not fulfilled, I know that there is no identity. Yet, seemingly, the condition is not sufficient.

In order to understand what must be done to remedy the situation, let us return to the case we were studying where the definition broke down. But, first, one might try to argue that it really does not break down in that case. The two pennyish objects are not symmetrically disposed in the field of vision, one is perhaps nearer the edge than the other, or nearer a certain object than the other is. Their relational properties would therefore be different; hence if we take all the properties, it is false that $(F).F(x) \equiv F(y)$. But suppose the two shapes were symmetrically disposed in my field of vision, and were the sole objects there, as might be arranged; even so they would not be judged identical. They would not, because they would not be perfectly symmetrical in their relation to me, as had been thought, for the reason that I myself am not symmetrical; hence what is on my left has a different relational character, in its relation to me, from what is on my right. The solution of the problem of the definition of identity is now at hand: the definition is correct, but in its application it must take into account the relations of the objects to something given, myself; only when that is done can uniqueness be unequivocally determined. The definition of identity remains the same, only it is no longer a pure concept belonging to a pure conceptual realm, for the relations which define the total nature of the object, and so its uniqueness, are anchored in a This, in myself as center.

The situation is the same in the case of knowledge by description. For there also I cannot leave myself out of account. I will prove this first on the plane of ordinary experience and then on the scientific plane. Let us come back to a former illustration. I know wholly by description the President of the United States; for I have never seen him and did not attend the ceremony when he took the oath of office. And for all I am aware, the earth has its double and the drama of its life is repeated there, with a man descriptively the same as Truman, serving the people there, descriptively the same as we are, for three, and even four terms of office; so that the definite description "the President of the United States" would apply equally to that person as to our Truman. Theoretically that

would seem to be the case; yet we all know that when you and I use the descriptive phrase in question, we mean it to apply only to our Truman; and we can so mean because the identity involved in a definite description, even when we are making judgments of description, not judgments of acquaintance, is not a pure concept (unless it refers to abstractions), for the relational property or properties that establish the uniqueness of the object to which it is applied are relations to This—to myself or some item in my field of experience, known by acquaintance. It is *my* Truman that I mean—the one connected most directly with data in my own field of experience; with the word "Truman" heard or seen in print, with the seen picture of him in the windows or the movies, and eventually with the sight or touch of him, if I should meet *him* by taking a train, not his double, by rocket transportation.

The same considerations are relevant to the uniqueness of physical and historical objects. The sun is the object most closely controlling my sunlike sensa; the moon, my moonlike sensa; the man, my manlike sensa—not some remote, yet possible twin of sun or moon or man. By "Caesar" I mean the object I would have meant had I seen or heard Caesar, and who was the nearest cause of all Caesarish phenomena of statues and monuments, manuscripts and books, such as my school copy of *De Bello Gallico*. In fine, all my descriptions, if they are to describe unique objects, must be brought into relation with my primary experiences, knowable by acquaintance.

To the unphilosophical person the supposition of a possible double of objects of denotation used in this argument would appear fantastic, yet is no more so than Maxwell's Demon, which, after all, proved something. So something is also proved by our imaginary double (which, for anything we know, may be real), namely that knowledge by description is anchored in knowledge by acquaintance, and depends upon it, because the uniqueness of the objects described can be determined only by reference to given experience. Since that is asymmetrical, everything in the knowable world is asymmetrically related to it, and can therefore be defined, theoretically, through relational properties based on it, even when the things to be defined are intrinsically similar. When viewed in

relation to myself, or to any item in the field of my experience, the total nature of each thing—intrinsic plus relational properties—is unique.

How often do we find ourselves making use of this principle in everyday life, when we want to identify something! Someone says to me 'Please hand me that book'. Notice that there must be some initial description telling the kind of thing to be identified; in this illustration, the kind is book. I answer (since there are lots of books in the room) 'Which book'? I may then be told 'The red book'. Now I have another descriptive concept, and, of course, I am nearer to identification. But perhaps it was overlooked that there is more than one red book, just as there was more than one book; so I reply (a bit impatiently perhaps) 'But *which* red book'? And it may very well be true that the red books are all alike, being copies of a new edition of some treatise, so that my interlocutor cannot distinguish them by means of any further concept; yet he is not at a loss what to say, for he says, "Oh, the book I want is the red one nearest your left hand", thereby identifying it with complete accuracy in terms of its relation to something given in my experience. And this is typical of endless acts of identification where similar things are involved and no descriptive, differentiating characters are known or available.

Conceptual impurity of the same sort exists even in science. Science does indeed make a brave attempt to free itself from reference to the This, and achieve complete objectivity and impersonality. Its ideal would be to replace the given by sentences expressing pure concepts, without remainder. By postulating the exact repeatability of every experiment, so that data may be freed from a space-time constant; by seeking to express physical laws in independence of any special axes; and finally, by assuming the reducibility of the biological, psychological and social-historical sciences to the physical (the goal of 'unified science'), it is hoped that this ideal may be realized. Yet the hope is forlorn, for the simple reason that if scientific concepts are to have application, they must, in order to define the uniqueness of their subject-matter, take the given into account. The objectivity of science is not impersonality, but interpersonality. Science is like a map: anybody

can use it, but it is meaningless apart from somebody's use. Or it is like a sign-post pointing, which must be interpreted by the wayfarer from the standpoint of his own given here and now.

Another limitation of knowledge by description is its incapacity by itself to distinguish 'exists' from 'existed' or 'will exist'. This can be made clear by comparing Russell's formula for 'Scott wrote Waverley' with what would be the formula for 'Shaw wrote Candida': both are the same in form, although Scott does not exist, while Shaw does. But I do not wish to make this limitation of knowledge by description depend upon any special formulation. It has long been the practice of logicians to ignore the distinctions between past, present and future, as if, one might think, they were too trivial for their exalted consideration! The ancient theory of "once true, always true" depends upon it. And one can easily see that on the pure conceptual plane these distinctions do not exist. The concept is, to be sure, extraverted; it says, in effect, 'x may have the character F', but of itself it never says 'x has F', 'x did have F', or 'x will have F'. So the logician would like to have a tense that would be neutral as to past, present and future; 'x exists' would then mean 'either x exists or x will exist or x has existed'; or else he would like, in every use of it, to have 'x exists' emended to include a specific time determination that might belong anywhere in the whole realm of time, from beginningless past to endless future. Under the latter rule, 'x exists' would be an incomplete expression, and would have to be made definite by writing, say, 'x exists at 10:30 A.M. September 20, 1944' or perhaps 'x exists at 11 A.M. December 1, 1989'. In this way the historical sequence would be expressed as a level, monotonous plane, unvaried by the changing prominence of the present, the existent. Yet such a procedure ignores vital distinctions. Before American soldiers entered Rome, I was deeply concerned over the fate of the church of San Carlino a le Quattro Fontane, loveliest gem of the Baroque. What I wanted to know was, Does the church exist? I did not want to know whether the church existed, say on January 2, 1944, a question which historians of the future may well answer or those of the past might perhaps have predicted, but whether it exists *now;* and that question no learned historian or wise prophet could ever answer, because for either of them "now" would have another

meaning than it has for me. The only proper meaning of 'exists' is 'exists now', for neither the past nor the future exists: the realm of the existent is the realm of the present. The neutral meaning of existence, if it pretends to be a substitute for exists in the genuine sense, is a fake. Moreover, I can know that a thing exists without knowing when it exists, showing that 'exists' and 'exists at a definite date' are independent in meaning. For example, I know that I exist, or that any item in the field of my experience exists, although I have forgotten the day of the week and month.

It is clear, then, that by itself the concept cannot express the now. To be sure I have the words 'now' and 'then', just as I have verbs with tenses, by means of which one might think that the distinctions between past, present and future could be expressed; but that is an illusion. In the realm of the imagination, admittedly a world where existence is ignored, these tenses also occur. In reading a story I am told that the hero *is* doing something, or did do something, but 'does', 'did' and 'will do' are only relative in the story, neutral places in a sequence, not connected with the absolute, living now of existence, contrasting with the dead past or unborn future. The author uses the word 'now', just as he may use the word 'exists', to evoke a semblance of this life, but he cannot create its reality.

It follows therefore that if I ask such questions as 'Does the church still stand?', 'What is he doing now?', 'Do men exist on Mars?', and someone gives affirmative answers, I cannot get his meaning unless I integrate the tense of his verbs and the equivalent concepts 'now' and 'exist', with given experience, with myself. But the knowledge I then have is no longer pure knowledge by description, but a compound of knowledge by description with knowledge by acquaintance—an integration of concept with intuition. For the now, the present, the existent, can be determined only through the given, the This, which I can know only through acquaintance.

In two ways therefore knowledge by description is impure: in the matter of uniqueness and in the matter of existence. In both these concerns knowledge by description is dependent upon, and has to be integrated with, knowledge by acquaintance. The consequences are far-reaching.

Our final problem is that of truth in knowledge by description. This is a subject that would require a separate article for adequate treatment, but I should like to suggest the main lines in accordance with which I believe a solution of the problem can be found. There are certain possibilities that offer themselves for exploration.

(1) We might hope to find truth in some internal character or 'truth quality' in descriptions themselves. We seem to find this quality in mathematical and logical propositions such as $2 + 4 = 6$, or $(x)\,F(x)$ implies $F(a)$. And we seem to find it in our personal memories and in the fitting of the concept onto the object in knowledge by acquaintance. What we call self-evidence might be identified with such a quality. But, although, as we have seen, every description has a certain initial plausibility, there is no discernible internal difference between a true and a false description as such. When I heard the news of D-day over the radio, it had no more *intrinsic* plausibility—no more plausibility in what was merely said—than a contrary false statement would have had, to the effect that D-day had not occurred. The false report of an armistice during the first world war, which was widely celebrated, had no less internal 'truth quality' than the news of the real armistice. The hope of finding the truth of judgments of description in some internal character is a forlorn one.

(2) We might seek truth in the way a description is confirmed by other descriptions—the way it fits into the world-picture of our culture: coherence as a test of truth. Coherence is, of course, not the same as consistency or non-contradiction between the elements of a description. Descriptions may be entirely self-consistent, logically, yet not coherent. The basis of coherence is not purely logical, but partly empirical: coherence means not consistency within a description, but with empirical laws. The concept 'mermaid' is not rejected because it is self-contradictory, but because it is inconsistent with empirical generalizations regarding animal anatomy and physiology. Moreover, coherence does not mean the consistency of one description with another. 'John is wearing a blue tie' and 'John is wearing a white tie' are inconsistent with each other, and therefore cannot both be true, but this fact does not tell me which is true; and so, 'John is wearing a white

tie' is consistent with 'John lives on Broadway', yet I cannot know that it is true for this reason. It is true, however, that internally inconsistent descriptions are implausible to the extent of impossibility, that descriptions inconsistent with known general laws are highly implausible and gain in plausibility when consistent; nevertheless, the criterion of coherence is insufficient for the following reasons:

First, it often happens that the description of a new kind of fact is known to be true, although it is not coherent with an accepted generalization—a revolution occurs in science. As Russell has said, only if there were no new crucial facts to be discovered, and men of science were mere makers of encyclopedias of accredited knowledge, would coherence suffice as a criterion. Second, two contrary descriptions may both, so far as we know, be consistent with general laws. One witness tells the jury that the accused wore a white tie; another that he wore a blue one, and there is no other information available on the subject. It is commonly assumed that if we knew all the facts, we would discover that only the red (or the blue) was in accordance with natural law; but that is dogma, not anything that we actually know, and would exclude free choice on the part of the wearer of the tie. Moreover, we are not engaged in deducing consequences from supposedly a priori principles, but trying to carry on an empirical metaphysical investigation.

(3) We might hope to discover some relation between the description and the thing described. The general theory that there is a distinctive 'cognitive relation' has been widely held in recent times, especially in America, and the question whether it is internal or external has played a significant part in the erstwhile controversy between idealists and realists. But on close examination the existence of such a relation becomes very doubtful. In my paper on "Knowledge by Acquaintance", I showed that the mere presence of an item, such as a sound, does not constitute knowledge of the item; but that, in addition, a concept must also be present and 'fit onto' it. The mere belonging to a mind of an item is, therefore, no cognitive relation. One might, however, think that the fitting of the concept onto the item judged, as a cap fits a head, would be the cognitive relation. But, while distinctive of knowledge by ac-

quaintance, it is clearly not a generic cognitive relation, for in knowledge by description it is characteristically absent, since concept and object do not belong to one field of experience.

Another relation often suggested is resemblance, accepted either as unanalyzable or as reducible to sameness of universals, or essence, including structure, as between the concept and the object described by it. The concept would be true if it is a 'picture of fact'. Now that resemblance functions importantly in knowledge by description, is indubitable, only not between the concept and its object, but between the base of the concept and its object. The concept is, as I have explained, a readiness to postulate the existence of an object like a primary experience or image. But, needless to say, likeness is not a distinctively cognitive relation, and, as Royce long ago remarked, the fact that twins resemble each other does not make one a knowing of the other, although, I should hold, it may help either to know the other, since each may use himself as a perfect 'base' for understanding his twin.

Still another relation involved in all knowledge is causality. Our concepts are created partly by their objects and partly by the activity of the self; and without determination by their objects, ideas would lose their relevance. In memory, the causality of the 'trace' of the past event is obvious; in historical knowledge, there *was* a causal relation between events and the primary evidence of their occurrence, such as eye-witness accounts, and there is a continuing causal relation between remoter evidential remains or effects, such as monuments and manuscripts, and the knower; in perception, a causal control is exercised by the object on the sense data through which we become aware of its existence; and all concepts are, directly, or indirectly, effects of their primary bases. However, since there may be causality without knowledge, it is clear that, although an essential factor in the knowing process, it is not uniquely the cognitive relation.

A final clue which one might follow would be the vectorial pointing of the concept to its object—its meaning its object. This is, indeed, a fact, but is it a relation? My answer would be that it is a unique activity, not a relation. If it were a relation, there would be some sort of *union* between the concept and the object, which does exist, it is true, in knowledge by acquaintance,

but characteristically does not exist in knowledge by description; or, to make a more cautious statement, there is no evidence that it exists.[11] In Santayana's picturesque language, knowledge is a salutation, not an embrace, except, I should add, in knowledge by acquaintance, where the concept does seize its object. I conclude therefore that there is no distinctive cognitive relation, as Sellars has long maintained.[12] Knowledge by description rests on a complex structure of relations of causality and resemblance, within which one term is a concept; a second, its object; a third the base of the concept. Directly or indirectly, the concept, its base and its object are interrelated causally; and the base and the object resemble each other—is perhaps this relational pattern what philosophers have meant by a cognitive relation?

(4) Finally, it has been maintained that the truth of a concept is its verifiability. Unfortunately, the simplicity of this formula is deceptive. Those who propose it as the open sesame to our problem have changed their minds about it; with the result that there are several meanings of 'verifiability' which have to be distinguished and discussed.

First, by verifiable may be meant the possibility of passing from knowledge by description to knowledge by acquaintance. "John's house is red" is true if I can find that the house is, in fact, red, by confronting my concept "red" with the actual color of the house. But, as a general definition of truth in knowledge by description, this would not do, for it could not apply to historical propositions. The truth of the proposition "Shakespeare wrote Hamlet" cannot be defined in terms of seeing Shakespeare writing the play. Nor could I so define the truth of my description of my neighbor's state of mind. It is a fact indeed that *if* my concept is true and I *could* confront it with what it means, it *would* cover its object, after the manner of knowledge by acquaintance; but

[11] See my *Experience and Substance*, Ch. XI, where I try to show that union or unity is the irreducible factor in relation. By the same argument one can show that there is no interest-relation—that interest, desire, love, etc., are activities, not relations. *Ibid.*, pp. 303-304. And how, when a concept means a past event can it be related to it—when the past event does not exist?

[12] Sellars discovered this as early as 1926. On the subject of the alleged cognitive relation, see the recent article by George Gentry, *Journal of Philosophy*, Vol. 40, No. 10. I did not see this article until after I had written this paper; but let me add that I am in full agreement with it.

since the condition cannot be fulfilled, a definition of 'true' in terms of this fact, although correct, is otiose, because it provides no criterion by means of which true and false ideas can be discriminated. The only concepts for which the definition is relevant are those whose objects are physical phenomena so far as they are presented in the mind of an observer, as a predicted eclipse, or expected psychical phenomena of one's own. A behavioristic definition of verifiability would reduce to the foregoing, for the behavior of anything is reducible to actual or possible data of a certain kind: at least I am personally yet to discover any other empirical definition of behavior. Behaviorists seem to take for granted that 'behavior' is a concept so luminous that it needs no analysis; I strongly suspect, therefore, that what they are thinking of is of such a speculative, 'metaphysical' character that it is beyond the range of empirical philosophy.

A final, and very conservative definition of "verifiable" would be simply, "based on evidence".[13] This definition has none of the faults of the others and is, I believe, in accord with the usual scientific and historical canons actually in practice. Here is not the place to examine the philosophical foundations of evidence, which would require a study of the whole problem of induction; I shall therefore do no more than call attention to the fact that, in knowledge by description, evidence consists of effects of the object known interpreted in accordance with certain accepted principles such as analogy or probability.

That the truth of concepts of description does depend on evidence seems clear. We do not accept a description as giving us knowledge, unless there is *some* evidence. This statement may seem to be in contradiction with our repeated assertion of the primary truth-claiming character of every concept *per se;* but there is actually no contradiction when we bear in mind the distinction drawn between the primary and the secondary meaning of judgment. Every concept does have an initial, primary plausibility, without which none could make any claim to truth whatever, both those based on evidence and those not so founded; but only

[13] Plato's μετὰ λόγου δόξα, instead of mere ἀληθῆ δόξα. Theaetetus 201 c. This is perhaps the same as Dewey's "warranted assertability".

the former are given full belief and are accepted critically as true.

A description is, therefore, accepted as true if it is based on evidence. Merely to have the concept of the earth as round is not to know that it is round: I must in addition possess evidence that the idea is true, as that I read that the earth is round is a book of astronomy or an encyclopedia, or better, that I saw its round shadow on the moon, or saw the top of the sail of an approaching ship before its prow. Merely to think of my friend as sad is not enough, I must have evidence of his sadness, such as seeing his slow gate and the drooping lines of his face or hearing his words. Evidence consists, as I have said, of the effects of the objects known, these *effects* being knowable by acquaintance, whereas in knowledge by acquaintance, the evidence consists in the presence of the very objects themselves. In practice, however, having evidence usually means possessing *memories* of the evidence, for seldom do I have the evidence at hand in the form of acquaintance: I know that the earth is round, because I *remember* having seen the top of the sail first, etc.; I am not seeing it now sitting in my study! Knowledge by description is thus again found to be dependent; it is dependent on at least two other cognitive functions; namely, upon memory, and eventually on knowledge by acquaintance of the effects, near or remote, of its object.

A concise summary of the ideas so far presented regarding knowledge by acquaintance would run somewhat as follows: Knowledge consists of the possession of directed concepts. In knowledge by acquaintance, the objects of these concepts are given into them, and hence always exist; in knowledge by description, the objects are absent, and they may or may not exist. In knowledge by description both the direction of the concepts to unique objects and the assertion of their existence depends upon their integration with primary experience. Although the mere existence of a concept is a witness to the existence of something, it is accepted as true with regard to any character affirmed of its selected object, only when there exists along with it the presence or the memory of *evidence* for it; provided in knowledge by

acquaintance by the givenness of the object itself, in knowledge by description, by the memory or the givenness of effects of the object. The concept offers the possibility, the readiness to envisage what the object is like, in terms of a 'base', which is either a primary experience or an image. Thus the concept 'round' is at once the affirmation of the existence of something, and a readiness to interpret whatever is judged to be round as being such as, for example, the shape of the ring on my finger, as I may see, remember or imagine it, or such as anything else such as that.

As a final part of this study of knowledge by description, I will offer a comparison between it and knowledge by acquaintance, with regard to five points considered in my essay on the latter.

(1) It was maintained that knowledge by acquaintance is always knowledge of existence. It is obvious that this is not true of knowledge by description. Some descriptions are of existence, as 'The President of the United States is a Democrat'; some, like 'Scott wrote Waverley', being historical, are of things or events that no longer exist. The failure to provide for the distinction between 'exists' and 'did exist' is one of the limitations, as we have seen, of Russell's formula.

(2) It was claimed that judgments of acquaintance may be infallible, except when they are concerned with border-line situations. That judgments of description are a contrasting species and are fallible, does not need proof, but only analysis. They all have a certain initial plausibility, which increases as evidence accumulates, and may become practically certain as evidence becomes overwhelming, but they are never infallible. In three ways they may go wrong: as to the existence of their object, as to its uniqueness, and as to the applicability of the concept or description ascribed to the object. The object may no longer exist; it may never have existed; it may be the case that it never will exist; there may be more than one such object; or, even though the object exists, did exist or will exist, and is unique, it may not, did not, or will not ever possess the character we are ascribing to it. In general, moreover, since in knowledge by description the concept moves away from its base to characterize an object which it does not embrace, and the evidence for it depends upon

the validity of the principles of induction, there is always something speculative about it. Nevertheless there is little excuse for the scepticism of certain philosophers, amounting almost to anxiety or *folie de doute*. And there is one respect in which knowledge by description *is* infallible, namely, in the assertion, which is common to all concepts, both true and false, that *something* exists, and to which all sensations veridical and deceptive, are also witnesses.

(3) The third characteristic of knowledge by acquaintance noted, was that, with regard to such knowledge, we know that we know. It is easy to see that this does not apply generally to judgments of description, but only when the evidence is overwhelming. Even then perhaps, if we are pathologically meticulous, there may still lurk some doubt whether we do know that we know. But concerning this point also, the exception noted under (2) holds good: we do know that we know the existence of *something*, through the mere possession of any concept, no matter what.

(4) The fourth characteristic of knowledge by acquaintance recorded was privacy. Such knowledge is private because it contains, as part of the proposition asserted, private data, inaccessible in their uniqueness to other persons. In contrast, knowledge by description would seem to be public because the proposition which mediates it consists wholly of concepts referring to generic characters that may be factors in anyone's experience. But, unless the results of this study are wholly wrong, the publicity of knowledge by description cannot be thus simply arrived at; or only if knowledge by description is so defined as to restrict it to those physical sciences in which abstraction is made of individuality, leaving the repeatable and generic their sole subject matter. Chemical formulae would be the best illustrations of knowledge of this kind; for, supposedly, anyone can repeat the relevant experiments and achieve the same results. But from the realm of science would then be excluded all the concrete sciences, such as geography and descriptive astronomy, where the subject matter consists of this or that landscape, and this or that heavenly body—the sun, the moon and the stars; history also would find no place, since its

concern is with individual events, localities, persons and cultures. Even physical science would cease to be directly concerned with reality, which is individual, but only with abstractions.

Such consequences are obviously to be avoided; but they can be avoided only if there is some way of surmounting the difficulty confronting the publicity of knowledge by description arising from the fact we have stressed, namely, that individuality or uniqueness can be covered solely by means of integration with knowledge by acquaintance, which is partly private—private as to the subject, though not as to the predicate of the propositions mediating such knowledge. The unique objects of knowledge by description cannot, as we have seen, be defined in terms of concepts alone; each knower must use the data of personal experience for this purpose. Since there is something incommunicable about these data, it would seem to follow that knowledge by description cannot be public, as is usually assumed. I mean that when we think we know that Caesar crossed the Rubicon or that the President of the United States is a Democrat, we could not know that our friend was meaning by "Caesar" or by "the President" the same person that we mean. Nevertheless, we are confident that we do mean the same persons, but how can we?

The answer is that we can know that we mean the same objects if you and I can know that my experience on the basis of which I define my unique object, and your experience on the basis of which you define your unique object, are elements in one unique world, within which the same, not merely similar, objects have in the past determined both your experience and mine, and will continue to determine both yours and mine in the future; so that my concepts of unique objects, with the data known by acquaintance by means of which I define them, can refer to, as being controlled by, the same objects you refer to. This is the metaphysical condition on which publicity of knowledge by description is predicated.[14] But observe that this condition does not establish the impersonality of knowledge by description, but, once more, its interpersonality. There is no possibility of pure, public

[14] The enquiry as to how this condition could be fulfilled is beyond the scope of this paper.

knowledge by description unintegrated with the knowledge by acquaintance of each knower.

(5) The fifth special characteristic of judgments of acquaintance noted by us, was the transiency of some of the propositions affirmed in them, and therefore of their truth. The data which form the subject of such propositions are themselves a part of the latter, hence, when they are transient, as for example sense data are, the propositions of which they are constituents are transient, since a whole is transient when its parts are. On first thought it might seem as if propositions of description would not have this character, since their subjects (objects) are not elements of them. Their truth however would be transient when they affirm the existence of transient objects or transient characteristics of their objects: the truth of the proposition 'The President of the United States is a Democrat' would change to falsity if he should be defeated in the coming election (Nov. 1948). The truth of such propositions would be as transient as their objects or as the properties of their objects. Only descriptive propositions affirming the existence of eternal objects or eternally relevant properties of such objects, would be eternally true; as for example, 'The universe is changing'. However, as is the case with propositions of acquaintance, corresponding to every transiently true proposition of description, there would be a historical proposition which would be eternally true; for example, corresponding to the proposition 'The President of the United States is a Democrat', which, as we have noted, is only transiently true (since Truman will eventually be succeeded by a Republican) there is the eternally true proposition "The President of the United States was a Democrat from 1945-??".

On the other hand, one might think that because, as we have shown, both existence and uniqueness can be defined only in terms of the This, and judgments of description must be integrated with judgments of acquaintance, all propositions, including the historical, would at least share the transiency of my field of experience. But this would be a mistake. Such a proposition as "The sun exists" means that the sun is part of a whole that includes This, which may be, let us say, a sound given to me; but

the vanishing of the sound would not entail that the proposition had no meaning, because the meaning of existence may be based on a new This, say a new sound that I hear, or on my matrix self, which may perhaps endure for some years longer. Just as the meaning of 'blue' requires as a base not this blue item, but any alternative blue item, so the meaning "exists" may be based on alternative Thises. What is true for me is true for any other self that uses the concept "exists". And when he and I have passed away another man may intelligibly proclaim 'The sun exists' because there will be Thises in his life to give the proposition meaning, even as there will be new blue things to give 'The field of the American flag is blue' a meaning.

Similar considerations apply to uniqueness. The uniqueness of objects of our judgments of description depends, as we have shown, on their integration with the given items of our experience. But it does not depend on integration with any single item—any item belonging to the unique whole will serve. Moreover, integration with items in the experience of any other person will establish the uniqueness of the objects meant in knowledge by description, so long as they are connected with mine in the one, unique, interpersonal whole of experience.

I conclude therefore that although the truth of propositions of description asserting existence is transient when their objects are transient, they themselves are not transient. Once more they are seen to be a species contrasting with propositions of acquaintance.

DEWITT H. PARKER

UNIVERSITY OF MICHIGAN

FREGE'S LOGIC

IN VIEW of the recognition generally accorded Frege as a pioneer in the field of symbolic or mathematical logic, it is a surprising fact that no systematic survey of his work as a whole has as yet been undertaken. Perhaps the nearest approach to such a study is a very interesting and full exposition and discussion of certain of Frege's basic doctrines in an Appendix to Bertrand Russell's *Principles of Mathematics;* but this, like the other discussions extant, does not pretend to present a clear general account of just what Frege was trying to do, or a critical estimate of how near he came to accomplishing it. The following article represents an attempt partly to fill this gap in the recent history of logic.

The principal works of Gottlob Frege (1848-1925) include the *Begriffschrift, eine arithmetische nachgebildete Formalsprache des reinen Denkens* (1879; later partly repudiated), *Die Grundlagen der Arithmetik* (1884, reprinted 1934), *Funktion und Begriff* (1891), and the *Grundgesetze der Arithmetik* (2 vols. 1893-1903), together with supplementary articles in various periodicals. An English translation of a small portion of the last mentioned work, by Johann Stachelroth and P. E. B. Jourdain, appeared in *The Monist* (Vols. XXV (1925), XXVI (1926), and XXVII (1927)).

According to Frege's great admirer, Bertrand Russell, the *Grundlagen* marks the beginning of "the logical theory of arithmetic". The first step, therefore, towards acquiring an understanding of the import of Frege's work for logic and mathematics must be to determine as precisely as possible the meaning of this phrase. As the title of the book indicates clearly enough, its author is explicitly concerned with the logic of mathematics, just as other scientists, before and since, have been concerned, among other things, with the logic of physics or biology, as the case may be. But in Frege's case this concern led in a certain direction, and issued in results of considerable significance for the future of logic, and more especially of symbolic logic, itself, as well as for the special science in question.

The starting-point of his studies was his interest in the demand

which had steadily been growing stronger for some time, for more rigorous proofs of mathematical propositions, and a more precise determination of the limits of their validity. The obvious need for accurate definitions in this context had led to new conceptions of functions, of infinity, and of negative and irrational numbers. And it led finally, in the work of Cantor, Dedekind, and Frege himself, to a radical attempt to define even the simple whole numbers themselves, and to prove the simplest laws binding these numbers together in a system.

And with Frege at any rate, the urge to go further yet, to search out and wherever possible to come to some definitive conclusions about the philosophical and methodological presuppositions of his science was insistent and dominant over all other motives.

Taking first the problem of definition, Frege finds that previous attempts at a definition of number have presupposed erroneous theories concerning what kind of object it is to which number can properly be ascribed, and that the resultant definitions have naturally enough failed of their purpose. Upon examination it will be found, according to this authority, that these theories fall into two groups, namely that number it to be ascribed to physical objects (Cantor, Schroeder, and especially Mill), or to psychological ones (Berkeley, Dedekind, *et al.*).

But physical entities may be regarded either as one or as many—*two* boots or *one* pair, thousands of leaves or *the* foliage of a tree, etc. Therefore Frege argues that it is impossible to predicate unambiguous numbers of such objects, or to define the numbers themselves unequivocally. Neither is the view that number is an object of psychology, or the resultant of psychical processes, at all tenable. Whoever determines the area of the North Sea as so many square miles, or the number of petals of a rose, is plainly not referring to a psychical state or process, but is stating a fact as objective as the saltiness of the sea or the color of the rose. What in fact is common to number and saltiness, or to number and color, for example, is not that they are both sensibly perceptible in external things, but that they are both objective. In fine, number is neither spatial and physical, nor subjective and mental,

but non-sensible and objective, like the earth's axis or the center of the solar system (*Grundlagen*, sec. 26). Thinking, it seems plain to Frege, creates none of these 'objectives'; rather, they are eternally 'there', metaphorically speaking, to be thought about. Hence any attempt either to determine the nature of number genetically, or to trace the historical development of the number-concept, and in this wise to inquire into its possible derivation from more elementary but less precise ideas, Frege rules out *ab initio* as beside the mark. Like Bolzano's ideas-in-themselves, which Frege's 'objectives' quite closely resemble, mathematical entities are thus assigned to a special, sacrosanct realm of being, not subject to the vicissitudes of this earth, which the fortunate spectator may discover and contemplate, and, if constituted like Bertrand Russell's "free man", worship from afar.

So far, then, the position has been reached that number is a predicate, neither of physical things nor of psychological ideas, but of objective concepts. In 'The earth has one satellite', 'one' may properly be ascribed, not to the moon itself (which may just as well be regarded as 'many' molecules), but to the concept or general term 'earth's satellite'. Still more clearly, in 'Venus has 0 satellites', '0' is a property, not of a physical object (for to what physical object could the number 0 apply?) but of the concept 'satellite of Venus'.

Here, incidentally, Frege points out that it is important to distinguish between the proper name of a thing, *e.g.*, 'Venus', and words signifying concepts; and especially is this so where only one object "falls under" the concept. Obviously it is nonsense to ask what objects fall under a proper name. 'The moon' is the proper name of the object falling under the concept designated by the words 'satellite of the earth' (*Grundlagen*, secs. 45-54).

Now it seems to be Frege's contention, though this is nowhere expressed with anything like the desirable clarity or convincing argumentation, that concepts, 'objectives', being neither mental nor physical, can therefore only be described as purely logical entities. It follows at once from such considerations, that number, as predicable of, or applicable to concepts, is also to be included within the general sphere of logic. Or, to put it in another way,

since the subject matter of both logic and mathematics belongs to the same realm, they are to all intents and purposes inseparable, if not identical sciences.

Since at all events number is applicable to concepts, and since concepts possess objective existence, in the sense elucidated above, existence and number may be said to have a certain something in common. In fact, "the affirmation of existence (presumably in the logical and mathematical sense of the word) is nothing other than the denial of the number zero (*Nullzahl*)" (*Grundlagen*, sec. 53)! Further consideration of the way in which numbers occur in statements shows, so Frege contends, that the copula 'is' of such statements is really an abbreviation for 'is equal to', or 'is the same as'. 'Jupiter has four moons' means 'The number of moons of Jupiter is four'; and this means, in turn, that the phrase 'the number of Jupiter's moons' designates the same 'object' as the word 'four' (sec. 57). Numbers, then, Frege concludes, designate "independent objects" (*selbstaendige Gegenstaende*).

Now it happens to be the case, however, that one genus of propositions is that which gives expression to a re-cognition (*Wiedererkennen*) of something proviously cognized. Hence if 'a' is to designate an 'independent object' unambiguously, there must be a criterion which will enable one to decide whether 'b' designates the same object or not. That is to say, in order to define numbers "we must clarify the meaning of the proposition, 'the number (*Zahl*) which applies to the concept F is the same as that which applies to the concept C'; *i.e.*, we must reproduce the content of this proposition in another manner, without using the expression, 'the number (*Anzahl*) which applies to the concept F'" (sec. 62). According to Frege it will be found that this clarification will further yield a general criterion for determining the equality of numbers, for grasping a determinate number as such, and for bestowing a proper name upon it.

But to be able to assert the proposition just formulated is tantamoun to being able to answer the question: When do the concepts (*e.g.*, F and C above) applicable to two collections of objects (*e.g.*, those 'falling under' concepts F and C) have the same number of terms—or, as would ordinarily be said, the same

extension? And the answer is: When there obtains a one-to-one relation between all the terms of the one collection and all the terms of the other, taken severally (such as that which holds, for example, of the collections 'husbands' and 'wives' in monogamous countries). Finally this "similarity" of two such collections—to use Russellian language—leads to the definition of the number of a given collection (extension of a given concept) as the class of all collections that are similar (stand in a one-one relation) to it; or, more precisely, 'the number of terms in a given class' is defined as the equivalent of 'the class of all classes that are similar to a given class'. Thus 'two' is 'the class of all couples'; 'three', 'the class of all triads', and so forth. Frege contends that this extensional definition follows from, and confirms, his view that numbers are to be predicated of concepts, that it yields the usual arithmetical properties of numbers, finite and infinite alike, and that it applies to '0' and '1', which are often treated as special cases, in the same manner as to all other numbers (cf. *Grundlagen*, sec. 62 ff.).

A rather obvious criticism of this definition, namely that it is circular, in that it presupposes the very terms it professes to define—although this circularity may be concealed by an elaborate technical circumlocution—has been advanced by various students of the logic of mathematics (*e.g.*, Kerry, Cassirer, Poincaré); but Frege and Russell have both rather abruptly brushed this criticism aside as based on a misunderstanding, and there, to all intents and purposes, the matter rests at the present time. Nevertheless, a feeling that all of the issues here in question have not yet been met as squarely as could be desired is bound to linger in the minds of students both of logic and of mathematics. And from many authorities—Husserl, Fraenkel, Brunschvicg, Spaier, Meyerson, to mention only a few—have come criticisms directed against various aspects of this whole extremely abstruse line of thought.

Why, for example, should it be *assumed*, without argument, that number must be a 'property'—to use the Frege-Russell terminology—or intrinsically 'applicable to', 'predicable of' anything at all? In fact do not the very considerations adduced by

Frege himself all but positively declare that number is essentially an extrinsic or relational determination of the phenomenal objects of experience, and not 'predicable of' them either ambiguously or unambiguously, for that very reason? The leaves of a tree are possessed of various properties *qua* leaves, or instrinsically; but they are not numerable *qua* leaves, but rather only because and in so far as they are phenomenal objects qualitatively or intrinsically distinguishable from all other such objects, and at the same time only extrinsically or quantitatively distinguishable from, and related to, each other. Unfortunately Frege debars himself from any such simple alternative account of the matter, by his deliberate refusal to consider the relevant history of the number concept, which certainly strongly supports this suggestion. And in holding instead that number is 'predicable of' concepts—*e.g.*, presumably of the concept 'leaf', among others—he is simply trying to assert in unsuitable and not merely awkward language, what he has forbidden himself to assert in suitable terms, with the result that both concepts and numbers come to be hypostatized, and the latter, at least, are thus miraculously transported across the borderline separating logic from the special sciences.

In other words, according to a most plausible alternative which Frege fails to consider, the scientific formulation of the concept of number involves a process of ideal selection and abstraction from the 'data of experience', whereby the notion of a whole (the number system) composed of related elements or 'units' ideally homogeneous with each other, and with the whole they constitute, is finally arrived at, and made an object of scientific—*i.e.*, mathematical—investigation on its own account. What renders this alternative especially attractive, not to say compelling, from the point of view of the logic of science, is that it alone squares perfectly with the generally accepted account of the way in which, *mutatis mutandis*, basic concepts of the other sciences have been logically formulated and developed. Sense perception provides the data, the raw material, for all of the natural sciences, and it is to essentially the same process of ideal selection and abstraction, differing however in the degree and extent to which it is carried out, that each of the several sciences owes its fundamental con-

cepts. On this view numbers constitute the simplest, most elementary, and most abstract system of relationships pertaining to the phenomenal order. On the contrary, to accept the account of the Frege-Russell school of thought of the way in which the number concept is arrived at, is arbitrarily to cut mathematics off from its undeniably intimate connections with the other sciences, and is to attempt to link it instead with logic, in an unholy alliance which actually raises more problems than it solves.

And there is one more important point worth mentioning in this connection. From the point of view of mathematics as a science, and that means as a progressively developing body of knowledge, the very attempt to formulate a definitive definition of number is basically mistaken. No definition of any scientific concept can be more than provisional and temporary, and no scientific definition can have more than pragmatic sanction as a working instrumentality of the science at any given stage of its development.

So much by way of exposition and criticism of the first phase of Frege's endeavor to provide an absolutely impeccable basis for mathematical reasoning.

The second methodological and philosophical problem, that of establishing criteria for absolutely rigorous proofs, may next be approached. The best brief account of Frege's teaching on this subject is also to be found in the *Grundlagen*.

Practising mathematicians are usually satisfied if the truth of the propositions composing their science is subject to no serious doubt, without being troubled too much by the problem of establishing the strict interdependence of truths with each other, and without searching too closely into the question as to what constitutes logical rigor in demonstration. But precisely these questions weigh most heavily upon Frege's mind, and will give him no peace until he has come to some definitive conclusion about them.

The ideal of a strictly scientific method in mathematics Frege describes in the following terms. Recognizing the utter impossibility of proving all propositions, the only alternative that he can envisage is to reduce to a minimum the number of unproved propositions, and to recognize and formulate these in the most explicit manner pos-

sible. This will insure clear knowledge of the fundamental premises of the science. And secondly all methods of proof must be specified definitely in advance, for otherwise the question of the validity of any given or proposed proof cannot be settled definitively and by general agreement. If arithmetic is to make good its claim to be only a more highly developed logic, no transitions from one proposition to another not vouched for by acknowledged and absolutely incontestable logical laws, can be allowed.

In this connection Frege adopts the Kantian terminology of analytic and synthetic, *a priori* and *a posteriori* judgments, but construes these terms in his own, decidedly non-Kantian manner (*Grundlagen,* sec. 3, 87ff.). For one thing, Frege finds that Kant's classification is not exhaustive. For example, the distinction between analytic and synthetic is made to turn upon whether the predicate-concept is, or is not contained in the subject-concept. But how about cases in which the subject is a single object, or those in which the judgment is existential? In neither of these species of judgment, argues Frege, is there any question of a subject-concept at all.[1] Moreover, Kant seems to think of the concept as determined by its adjunct marks or properties only, but according to his critic this is only only one of the least fruitful ways of constructing a concept. Frege holds that scarcely one of the definitions formulated in the *Grundlagen* is of concepts composed in this fashion. Or consider the definiton of the continuity of a function. There is here no series of adjunct properties, but rather an organic unity of determinations. And what can be deduced from such a definition is not to be discovered beforehand, so that propositions embodying these consequences are according to Kant synthetic; yet (according to Frege) they can be demonstrated by pure logic, and are hence also analytic. Furthermore, more than one definition is often required for the proof of a propositon, so that it cannot be said that the conclusion follows from any one alone, and yet it may follow in purely logical fashion from the several definitions conjointly. Very often, indeed, says Frege, one first acquires the content of a proposition, and is then confronted with the difficult problem of finding a rigorous proof for the

[1] This criticism of course overlooks Kant's contention that concepts without percepts are empty and percepts without concepts are blind.

proposition. Hence it is essential to differentiate these two features of propositions from each other.

These considerations lead Kant's critic to the conclusion that the distinction between *a priori* and *a posteriori,* between analytic and synthetic, properly apply, not to the content, but to the means of justification of the judgment. From this point of view, "to call a proposition *a posteriori,* or analytic, is not to pass judgment upon the psychological, physiological, and physical conditions which have made it possible to form the content of the proposition in consciousness, nor about how another person has happened—perhaps in an erroneous manner—to maintain its truth (is Frege charging Kant with proceeding on these lines?), but upon the ultimate grounds of the justification for the maintenance of its truth". In this way the question is removed from the domain of psychology, and referred to the domain of mathematics. Thus it becomes a matter of finding the proof for the propositon, and of following this proof back to the basic truths upon which all that follows rests. If these basic truths turn out to be general logical laws, and definitions, then the proposition in question is analytic *a priori.* But if, on the contrary, it is not possible to carry out the proof without using truths referrible to a particular domain of knowledge, then the proposition is synthetic. And if the proof involves appeal to matters of fact it is *a posteriori.* According to Frege it can be shown that the propositions of arithmetic are in this sense analytic *a priori,* while those of geometry are synthetic. But if the criticisms advanced above have any validity, then this contention is highly questionable.

At all events, the two complementary contentions which have emerged so far from this study of Frege's work on the foundations of mathematics are: (1) that the basic concepts of arithmetic can be reduced, by the process of definition, to concepts of pure logic; and (2) that the basic propositions of arithmetic may be derived, by the process of proof, from purely logical premises. The *Grundesetze der Arithmetik* undertakes to justify this thesis by actually establishing the science in the manner proposed. As a means to this end the author devised a symbolism which almost succeeds in literally picturing the interconnection of the successive steps in his demonstrations. Unfortunately, however, this sym-

bolism is so cumbersome and inflexible that it is well-nigh unworkable, and has generally been discarded by later students of symbolic logic. For this reason, no attempt will be made to introduce it, or the specific demonstrations clothed in it, into this account. Attention will be concentrated, instead, upon the logical foundations of the work as a whole.[2]

These foundations are, to say the least, very peculiar. There is no doubt that they are rather difficult to comprehend, and this fact may lead some students to suppose that they are unusually profound; but such is by no means the case. The difficulties spring, rather, from Frege's odd terminology, and from his use of familiar terms in unfamiliar and even very strange and ambiguous senses. Even so staunch an admirer as Russell himself (in his *Principles of Mathematics:* Appendix A) finds some of Frege's doctrines very curious, some untenable, and some the result of a simple confusion of psychology with logic. Russell nevertheless declares —whatever such a declaration can possibly mean in the light of these criticisms—that Frege's work "avoids all the usual fallacies which beset writers on logic"!

In an article entitled "Ueber Sinn und Bedeutung" in Volume 100 of the *Zeitschrift für Philosophie und philosophische Kritik* (1892, pp. 25-52), Frege first sets forth some conceptions that are all-important for a proper understanding of his later work. Taking 'signs' and 'names' to include any sort of notation for proper names, he in turn construes the *Bedeutung* of the latter as the definite objects (*Gegenstaende*) to which they apply. Thus 'evening star' and 'morning star' may be proper names for the same object, and in such circumstances their *Bedeutung,* their indication (to adopt Russell's translation), will be the same, but they will nevertheless differ in meaning (*Sinn*). For in the meaning is contained the mode or "way of being given"; while the indication of a proper name is the object it indicates. "A proper name (word, sign, combination of signs, expression) expresses its meaning, and indicates or designates its indication" (p. 31). Finally, it should be specially noted, proper names, so construed,

[2] Any reader who is interested in studying Frege's symbolic calculus in detail may be referred to Vol. I of Jørgen Jørgenson's *Treatise of Formal Logic.*

cannot apply to concepts or relations; separate consideration of their logical rôle will come later.

But now comes an application or extension of this doctrine which is little short of astounding. Frege observes that it is also permissible and necessary to speak of the meaning and indication of an entire assertive sentence. Some sentences, however, for example those poetic assertions which have as subjects proper names, such as 'Odysseus', which indicate no real object, seem *ipso facto* to have as a whole no indication but only a meaning (say, as part of a poem). And in this case the sentence has no value, when the question of its truth or falsity, as distinct from its meaning, arises. Thus it can be said that "it is the search for truth that inspires us to press on from the meaning to the indication" (p. 33). And conversely, to ask for the truth-value of a sentence is to seek its indication, and hence the indication of its proper parts. From this line of reasoning Frege concludes that he is compelled to recognize the truth-value of a sentence—*i.e.*, the fact that it may be either true or false—as its indication. And thus every assertive sentence is to be taken as a quasi-proper name, whose indication, if it have one, is either the true or the false. Of this doctrine Frege himself observes that this implicit denomination of truth-values as objects (*Gegenstaende*) may appear to be merely an arbitrary edict or verbal jugglery, from which no important results are to be anticipated. Yet he insists that in every judgment—*i.e.*, in every assertion or recogniton of the truth of a thought content—a transition has already implicitly been made from subjective ideas to objective indications. For "a truth-value can no more be part of a thought content than can the sun, which is not a meaning but an object" (p. 35). Furthermore, it is obvious on this view that all true propositions have the same indication, as do also all false propositions, however much they may differ in meaning; and this dichotomous division of propositions will turn out to be an important consideration from the point of view of logical demonstration as Frege conceives it.

Frege nevertheless also states that to say, 'the thought, that 5 is a prime number, is true', is to say no more and no other than that 5 is a prime number' (p. 34). But on this point Russell sharply (and rightly) disagrees. "There is great difficulty in avoiding psycho-

logical elements here, (he says) and it would seem that Frege has allowed them to intrude in describing judgment as the recognition of truth. Psychologically, any proposition, whether true or false, may be merely thought of, or may be actually asserted; but for this possibility, error would be impossible. But logically, true propositions only are asserted . . ." (*Prin. of Math.*, Appendix A).

It is, however, by means of the preceding doctrine that Frege develops his strange conception of functions, to which attention must next be directed. For it is in terms of this conception that he will explain what he means by a 'relation' as distinguished from objects and concepts. Readers who know their calculus are familiar with the mathematical concept of function, involving the idea of one or more independent variables, each capable of assuming all values in a given domain. Thus the quantity y is said to be a function of the independent variable (or argument)—symbolized by $y = f(x)$—or of the n independent variables (or arguments) $x_1, x_2, x_3, \ldots x_n$, if to every value or set of values which the independent variable or variables may assume, there corresponds a value of y. For example, the distance traveled by a moving body is a function of several independent variables, such as the time during which the motion takes place, the initial velocity, the accelerative force, or forces, and the resistance. And the dependent variable may remain constant while the independent variable varies, as a person's weight at successive intervals of time. But on pain of being badly confused otherwise, such readers had best rid their minds entirely of this ordinary mathematical conception, when attempting to understand Frege's doctrine, though Frege does use some mathematical terms to explain his meaning.

Russell quotes the two following statements from Frege as to the nature of a function: (1) If in an expression, whose content need not be propositional (*beurtheilbar*), a simple or composite sign occurs in one or more places, and we regard it as replaceable, in one or more of these places, by something else, but by the same everywhere, then we call the part of the expression which remains invariable in this process a *function*, and the replaceable part we call its argument. (2) If from a proper name we exclude a proper name which is part or the whole of the first, in some or all of the places where it occurs, but in such a way that these places remain

recognizable as to be filled by one and the same arbitrary proper name (as argument positions of the first kind), I call what we thereby obtain the name of a function of the first order with one argument. Such a name, together with a proper name which fills the argument-places, forms a proper name (cf. *Grundgesetze*, p. 43).

As Frege remarks, this way of regarding functions extends the circle of functional values far beyond the range of numbers; and, as he does not make sufficiently clear, also alters entirely the meaning of the term. For example, taking 'the present President of the United States' as a proper name, 'United States' is the argument and 'the present President of' is the function, in Frege's terminology. Similarly, '$x > y$' is a first order function with two arguments; and by carrying the procedure a step further a second order function may be obtained: 'There is at least one value of x satisfying ϕx' is a function of ϕ, which is itself a function. Functions of the first order with two variables, it should now be carefully observed, *express relations*. This illustrates the way in which relations are to be construed generally in Frege's logical calculus. And finally, the value of the function '$x^2 = 4$' is either the truth-value of the true or the false; and '$2^2 = 4$' and '$3 > 2$' *indicate* the same truth-value, namely the true. In '$x^2 = 4$', the value is the true for the arguments '2' and '-2', and the false for all other arguments.

The next notion to be introduced is that of a range (*Wertverlauf*). The extension of a concept, Frege defines as the range of a function whose value for every argument is a truth-value (*Grundgesetze*, p. 8). In this sense the intensional aspect of concepts is logically prior to their extensional aspect, and hence he holds that Schroeder was badly mistaken in taking the opposite view. Two functions are said to have the same range when they have the same value for every value, say, of x; when, namely, for every value of x both are true or both are false.

The importance of this doctrine is, that if 'range' be identified—as Russell helpfully suggests—with what Russell calls a 'class', cardinal numbers can hereupon be defined in such a way as seemingly to unify logic and mathematics even more completely than was possible in terms of the earlier and simpler doctrines of the *Grundlagen*. Only, following Frege's intensional view, number will

still be a 'property' of class-concepts, not, as for Russell, of classes in extension (and accordingly criticisms similar to those already expressed above also apply here). To quote Russell, "if *u* be a range, the number of *u* is the range of the concept 'range similar to *u*' ". On this 'logical' basis, Russell asserts, the *Grundgesetze* proves "various theorems in the foundations of Cardinal Arithmetic . . . with great elaboration, so great that it is often very difficult to discover the difference between successive steps in a demonstration".

To complete this account of this part of Frege's work it only remains to set forth his doctrine of logical implication, which is very simple indeed. According to Frege, the sole mode of drawing conclusions requisite for his demonstrations is a dichotomous relation which holds between *p* and *q* whenever 'either *q* is true or *p* is not true'—(false)—where *p* is not necessarily a proposition, and whatever *q* may be (*Grundesetze,* pp. 25ff.). *Whatever q may be,* 'the truth-value of *q*' indicates the true if *q* is true, and the false otherwise. Negation is indefinable, and belongs to the content of an assertion; and the joint assertion of *p* and *q* is the denial of '*p* implies not-*q*'. In the process of 'proof' all *further* definitions are merely nominal, in that they substitute a simple, brief expression for a more complicated one.

The statements just made, however, should not be taken to mean that *all* definitions are nominal. On this point Frege is very explicit, to the effect that mathematics requires definitions (like those of number, given above) which will enable one to decide unambiguously whether for example a given empirical thing 'falls under' a given concept or not; *i.e.,* whether the concept can be predicated unambiguously of the thing or not. And a similar test must be applied in defining relations. A plain implication of this doctrine, namely that concepts can never be subjects of categorical judgments, Frege also always maintains. Ultimate simples, of course, are indefinable, and their nature can only be made clear by some method of 'pointing out'; so that in the end, it would seem, curiously enough, all non-verbal definitions must rest upon a quasi-empirical test of givenness.

Furthermore, in addition to the one law of reasoning formulated above, Frege either implicitly or explicitly recognizes the

universal validity of the usual so-called laws of thought—the laws of identity, non-contradiction, and excluded middle. Whether these laws are in some sense ultimate, or derivative from such as are—and if the latter, what these ultimate laws are—is never brought out. But it hardly seems worth while, in the light of subsequent developments in symbolic logic, to pursue a criticism of what is manifestly, in these very important respects, an unfinished piece of work.

But is it not astonishing, to anyone at all familiar with the actual intricacies of even the most rigorous mathematical reasoning, and the richly diverse procedures deemed essential to their work by the greatest mathematicians, to be told that the sole method of demonstration which ideally *ought* to be recognized is that which Frege specifies? How perverse in principle is the demand that human reason, even when occupied with the high abstractions of pure mathematics, deliberately restrict itself beforehand to any one such quasi-mechanical routine! No more than definitions fixed once and for all, would this principle of inference, if so it may be called, really serve the very complex logical requirements of a genuine science. Even the qualifications suggested by Russell in his discussion of Frege's doctrines are not such as to render the principle more adequately representative of modes of reasoning which both mathematicians and logicians recognize as both indispensable and perfectly legitimate for the purposes of even the most rigorous science. Under these circumstances, one is forced to the hard alternative of either accepting Frege's dictation and of throwing out, as a consequence, much of what would otherwise pass as perfectly valid reasoning, or of simply refusing to abide by the severe strictures which Frege would impose. And there can be little doubt as to which alternative will actually prevail in practice.

In the second volume of the *Grundgesetze,* moreover, the author gives much space to a sound criticism of formalist theories of mathematics, which hardly seems quite consistent with all that has gone before. The formalist is one who thinks of his science as closely analogous to a game such as chess, the counters or figures meaning nothing in themselves, but serving merely as tags to which arbitrarily fixed rules may be applied. According to the

critic, this view forgets the difference between a theory of the game, and the game itself. "The moves of the game take place, it is true, according to the rules; but these rules are not objects in the game, but constitute the basis of the theory of the game. In other words, while the moves in chess take place according to rules, no position of the chess figures, and no move, expresses a rule; for the status of the figures in a chess game is in general not to express anything, but simply to be moved in accordance with the rules". So in *formal* arithmetic 'a + b = b + a' would have to be regarded, not as an object of the game, but as one of the rules forming the basis of the theory of the game (*Grundgesetze*, II, 114). The actual rules of arithmetic, however, are really based upon the import of the symbols, and this import, according to Frege, is none other than the content of the science. But could you not, indeed must you not go further, and by broad analogy construe logic as theory of reasoning, and mathematics (as well as every other science) as operating *with* certain material, *according* to the laws of logic? Must one not here also, much as in the case of the game, carefully distinguish between laws according to which one reasons, and premises from which one reasons—a basic distinction which it would seem that Frege had implicitly failed to observe in his own case?

At all events Frege insists that mathematics is a genuine science whose aim is truth, and not a mere game played according to arbitrary rules with meaningless counters. One potent consideration that is of itself decisive here, is the fact to which Frege calls attention, that mathematics can be applied to all sorts of problems in many fields, whereas a mere game, by its very nature, can be applied to nothing.

Such, then, in brief, are the results attained by a logician and mathematician in struggling with problems which have since been wrestled with by a host of other students of those subjects. Richly suggestive and stimulating though Frege's pioneering endeavors undoubtedly are, it must be admitted that he succeeded rather in raising such problems than in settling any of them in a tolerably satisfactory manner. Not only is his work essentially incomplete, in spite of its considerable voluminousness, but in failing to con-

sider other possible solutions more consonant with the actual developments in mathematics as a going concern, it must be admitted that he seriously misdirected and misguided other thinkers, and that from a philosophical point of view in particular his equipment for the tasks he set himself was obviously far short of being adequate. Neither in formulating his definitions of numbers, functions, and the like, nor in his attempted identification of (objective) truth with truth-values, nor in his theory and practice of mathematical reasoning, does he reveal profound appreciation of the philosophical issues involved, much less succeed in meeting those issues squarely.

H. R. SMART

CORNELL UNIVERSITY

DISCUSSION

PROFESSOR HARTSHORNE'S SYLLOGISM: CRITICISM

Two points may be made in final consideration of the validity of Professor Hartshorne's syllogism:

First, that the syllogism in its original form is at least misleading and inexact is tacitly admitted by the author when he says (THE PHILOSOPHICAL REVIEW, January 1945): "It is only for the sake of brevity that the argument is so stated that it seems to substitute 'God' for 'whatever' and thus to assume God as an entity. The substitution is rather of the *term* God (or perfect being) for 'term standing for a coherent conception.'" Whether "term standing for a coherent conception" is the equivalent of "whatever is coherently conceived" and the *term* God the equivalent of God is questionable. Has not the author here translated the premises in an arbitrary manner, and thus altered the meaning of the argument communicated, whatever his own possibly steadfast intention may have been?

Secondly, it may be shown that the syllogism in its altered or translated form is also fallacious.

Maj. P. The "term standing for a coherent conception" is either actual or an unactualized potency.

Min. P. The "*term* God" is a coherent conception.

Concl. God is either actual or an unactualized potency.

Says Professor Hartshorne: "That God is an entity is not assumed but deduced from the two premises together." Supposing that the meaning of "*term* God" is clear to the author, how this subject of the minor premise can suddenly become the *entity* God, subject of the conclusion, is difficult to see. On the other hand, although "whatever is coherently conceived" and the "term standing for a coherent conception" are not equivalent in meaning, they share the factor that they must both refer to things, since actuality implies entity, and the author recognizes that "unactualized potency is also something". Entity must be assumed again in the subject of the minor premise, since it is substituted by the author for part of the major, and the conclusion that God is an entity is not really a deduction but a restatement of assumptions in the premises.

WILLIAM ELTON

THE OHIO STATE UNIVERSITY

PROFESSOR HARTSHORNE'S SYLLOGISM: REJOINDER

Mr. Elton has scrambled together fragments from my two discussions in a manner not authorized by either of them, or by any compounding of the two according to logical rules. I asserted no such "equivalences" and no such "syllogism" as he correctly but irrelevantly

queries. The formulation implied, but not fully stated, in my second discussion was:

To every "term standing for a coherent conception" there corresponds either an actuality or a potentiality.

"Perfect being" is a term standing for a coherent conception.

Therefore, to the term "perfect being" there corresponds either an actuality or a potentiality.

The argument may then proceed by showing that no potentiality can correspond to "perfect", and hence an actuality must correspond. (I now think that, with suitable alterations elsewhere in the argument, it would be possible to eliminate reference to "potentiality", but this cannot be set forth here.)

Mr. Elton charges that in both premises the argument "must" assume the "entity" to be proved, but that the minor premise mentions no entity, so that entity ought not "suddenly" to appear in the conclusion! Well, the major premise assumes the *meaning* "coherent conception", and it *conditionally* assumes, "if there is a meaning then there is a corresponding actuality or potentiality". This no more assumes actuality or potentiality than "if A then B" assumes B. The minor premise assumes the term "perfect" and its coherent meaningfulness. From the assumptions mentioned, which do not include any reference to God as an entity, it is deducible by ordinary rules that there is an entity, if not a potentiality then an actuality, corresponding to "perfect".

Mr. Elton might argue that I could not know that every meaningful idea has a relatum, a something meant, unless I knew that this were true even of the idea of God. But surely I can see, without considering any question about God, that meaning as such is a relation between sign and thing signified, and therefore that if there *is* nothing which is in the relation of being signified, then there is no meaning. Again, I can have evidence that "perfect" has meaning, without reasoning, "there is a perfect being, hence I can mean something by the term". Rather, what I do is to define perfect in terms which experience shows severally to have meaning—such terms as "superior to", "all", "conceivable"—and then proceed to derive consequences from the definition, being on the watch for incompatible ones. If none turn up, then I have some ground, even though not conclusive, for supposing the definition consistent.

A final objection might be that, appeal being made to experience to furnish meanings, the argument is not a priori, as it pretends to be. But no argument should pretend to use meanings not in any way derived from experience. The question is only this, granting enough experience to establish meanings, do these meanings leave open the alternative, existing or merely possible, or do they decide for existence. Now, so far as what is meant are contingent, imperfect charac-

ters, meanings alone never decide for existence. Such precarious relation of nature and existence belongs to the dependence for very being which characterizes the imperfect as such. By the same token, the perfect is a nature which *essentially* exists. Its non-existence would imply unfulfilled conditions of existence, whereas no conditions, *fulfilled or not,* can be admitted of that conceived as perfect, and therefore as unconditioned with respect to existence. "There is no perfect being" can therefore only be construed to mean, "perfect being is logically absurd". Hence, *either* "there is a perfect being" is also logically absurd, or it *has consistent meaning but is without meaningful alternative and thus is true by necessity.* The one question just is, can we think God? For to think him is logically one with knowing him.

CHARLES HARTSHORNE

UNIVERSITY OF CHICAGO

REVIEWS OF BOOKS

An Essay on Man. By ERNST CASSIRER. New Haven, Conn. Yale University Press, 1944. Pp. ix + 237.

This is the last book Professor Cassirer wrote. One cannot read it without feeling afresh how deep a loss the philosophic community sustained in his recent death. He was a mind of extraordinary range, equally at home, to all appearances, in the ancient literatures and in modern science, in history and in mathematics. He wrote extensively in both German and English. He had taught at Berlin, Hamburg (where he was rector of the university), Gothenburg, Oxford, Yale, and Columbia. Yet, as those who knew him will recall, he carried his learning lightly, and there was little suggestion about him of the Teutonic scholar; what impressed one rather was a singular simplicity, frankness and charm. Technically speaking, he had been for many years and in various countries a refugee. But no one thought of him as such. His cosmopolitanism, his graciousness, and his rare gift for language made him quickly at home in any land.

This book is full of evidences of Cassirer's breadth of learning. It is in a sense a summary of his general philosophy. Some twenty years ago he published a massive work in three volumes on *The Philosophy of Symbolic Forms,* which has never been translated. Thinking it not very likely that it ever would be, he wrote this book to present to English readers, with new illustrations and reflections, the main drift of the earlier argument. The central contention is that if we would understand the nature of man, we must study, not his supposed metaphysical essence, but his functions or activities, what he does. And the most distinctive thing about his activities is that they are symbolic. He does not, like the animal, live in the immediate; he can look before and after; he can set up remote ends, ideal satisfactions, and pursue them persistently and variously. To know what he is, therefore, one must inspect these symbolic activities closely, bring to light their ends, and if possible discover some single end that gives direction to them all and brings them into harmony. In the first part of his book Cassirer lays this down as his avowed purpose.

But then the plot thickens. These symbolic activities embrace all the more important activities of man, and if they are to be duly scrutinized, one must offer something of a phenomenology and philosophy of myth, religion, language, art, literature, history, and science. On this tremendous task Cassirer launches bravely out. It would be impossible for so rich a mind to range over so vast a region without saying much that is illuminating, and this he does. If one wants to know what a ripe intelligence thinks about the various theories of the origin of language, or Frazer's theory of magic, or the play theory of art,

or Croce's or Nietzsche's or Lamprecht's or Ranke's theory of history, or the religious significance of taboo, or the place of Pythagoreanism in the development of science, one will find the answers here, together with countless other carefully weighed conclusions and arresting *obiter dicta.*

Does this suggest a feast marked more by richness than by order? If so, one shares the impression gained by the present writer. With the author's prospectus in the back of his mind, the reader moves along expectantly, assured that so competent a guide will draw the threads together and show how all these activities converge upon some end that will illuminate and harmonize them. As he reads on, he feels a gradually growing uneasiness. Each successive chapter is good, but the picture of man that was to emerge from the harmonization does not seem to be coming nearer. Perhaps the synthesis was to be reserved to the end. I own that in my eagerness to see how it all came out, I peeked like a bad detective-story reader; there is a chapter called 'summary and conclusion', and I leaped forward to that. Even there I did not find what I looked for. The only thing offered as common to the various symbolic activities was a tension between conservative and progressive impulses—a tame conclusion, after all, to so much labor and learning.

It is not often that great breadth of learning and great gifts of speculative synthesis go together. Their combination is not impossible; Aristotle, Hegel, and Lotze, for example, achieved it magnificently. But the two things sometimes get in each other's way. Great learning requires much rapid registry of facts and a mind attentive to detail. Speculative depth requires much abstraction from detail, much leisurely rumination, the persistent, patient exploration of numberless wandering paths. It is hard not to think, as one reads a book so wealthy as this in historic and scientific erudition, but at the same time so oddly inconclusive, that Cassirer was rather a distinguished reflective scholar than a great speculative philosopher. The learning is not mobilized in the interest of any theory; the book is not so much an 'essay on man' as a series of essays, all suggestive and enlightening, which converge on—what? It is hard to say. Perhaps there *is* no end, or harmony of ends, toward which all these activities are moving. But then, on Cassirer's own showing, no philosophy of man would seem to be practicable; there would only be a theory of art, a theory of religion, and so on. This is in fact what he gives us. And an admirable gift it is, for which I, at least, am thankful. Only it is not what he sets out to give, nor all that the reader hoped to gain.

BRAND BLANSHARD

YALE UNIVERSITY

Mind and Deity. By JOHN LAIRD. New York, The Philosophical Library, 1941. Pp. 322.

When Professor Laird was invited to give the Gifford Lectures at the University of Glasgow in 1939 and 1940 he found it convenient to divide the two series of lectures in a rather unusual way. Having developed a realistic viewpoint through a long list of earlier books, he naturally inclined to approach the problem of theism in terms of this viewpoint, while realizing that many influential theologies depend for their strength on rejecting realism in favor of an idealistic orientation. This situation suggested an appropriate way of dividing the lectures. In the series given in 1939 he adopted a provisional realism and devoted himself to a critical analysis of those phases of the theistic problem which did not seem to be weakened when presented on a realistic basis. This meant, concretely, an analysis of the cosmological approach to theology, including the traditional cosmological and teleological proofs, and a consideration of such attributes of God (*e.g.*, eternity, omnipresence, omnipotence, creativity) as acquire their meaning primarily in terms of this approach. The results were published in 1940 under the title *Theism and Cosmology.*

It is the second series of this course of lectures that appears in the present volume. Here Professor Laird reconsiders the realism tentatively adopted in the first series, and examines the arguments for theism which require the assumption of an idealistic rather than a realistic philosophy, or at least gain force when presented on such a foundation. In carrying out this aim he begins with a criticism of the ontological proof, then analyzes the presuppositions of idealism, and proceeds in the balance of the book to a discussion of the divine attributes which can be dealt with best in this context, such as omniscience, personality, providence, and moral rightness.

What is the general outcome of this second argument? Well, so far as concerns the realistic epistemology provisionally assumed, Professor Laird finds it necessary to modify his earlier position but not to abandon it. The fundamental modification consists in recognizing that not all knowledge is transcendent. In every piece of awareness, he now holds, there is transcendent knowledge of some object, but there is also reflexive awareness of the knower's self[1] He does not believe, however, that this reflexive selfawareness can properly bear the weight of the imposing metaphysical conclusions that idealistic philosophers and theologians have rested upon it. So far as concerns the sort of theism that emerges from the author's analyses, it is theism at all only by virtue of his rather generous definition of this term. He rejects as improbable the conception of God as a personal

[1] Pp. 76-82.

being transcending the world. God is best conceived, he thinks, as a divine aspect or dimension of the world itself—that aspect in virtue of which we find in its dependable law and a support for the values that religion in its wisest forms prizes. "God" stands for the impersonal "deiformity" of the natural order, whose recognition is necessary if the world is not to be interpreted in sadly truncated fashion. This conclusion, however, is only the most probable one on the evidence; neither it nor any other conclusion in these matters is capable of coercive proof.[2]

Detailed criticism of such a volume might lead in various directions. As one familiar with Professor Laird's earlier books would expect, all the problems dealt with are placed in a broad historical context. While the specific analyses introduce little that is original, they exhibit the provocative keenness that arises from complete absence of any eagerness either to reach conclusons that would please the orthodox theist or to insist on ones implying that theology is nothing but wishful thinking. The author maintains a very high level of philosophic impartiality in dealing with this difficult subject. Adverse criticism can find its opportunities, of course. In this regard, it seemed to the present reviewer that Professor Laird's conception of mind is especially inadequate. He unblushingly holds to a rationalistic psychology, assuming that the cognitive faculty is the chief factor in the constitution of mind.[3] And while he does not entirely neglect the field of problems connected with the sub- or un-conscious mind, there is no serious grappling with the challenge which they pose to any thinker attempting to work out a theory of mind in the light of all the relevant contemporary data.

The most unfortunate defect, I submit, is one which is shared by these Gifford Lectures with most other philosophical treatments of theology, past and present. Almost all such works conform to a fairly standard pattern, so far as the fundamental methodology assumed is concerned. The defect is sharply brought out in the following passage, which summarizes objections which Professor Laird wishes to urge against the view that he calls "totalitarian pantheism". "Is it credible that the whole could be perfect in knowledge and healthy if its parts were weak and diseased; righteous altogether if its parts were vicious, misguided, and corrupt? It seems to me improbable in the highest degree that things could happen so."[4] Now if the question be put in just this form, assuming a realistic interpretation of the relation between whole and part, I should entirely agree with the estimate of the probabilities here expressed; indeed, I should go further and say that on that assumption such a conclusion is not only improbable but

[2] See especially pp. 310-316.
[3] P. 65. [4] P. 282.

quite incredible. The yawning logical gap in inferences of this kind appears when we ask the question: What is Professor Laird's criterion of probability in dealing with these matters? The question is not easy to answer. No criterion is explicitly put forward. Seemingly, he believes that when he has brought to light difficulties with rival views on omniscience, or providence, or divine goodness, and presented considerations which support his own view, he has established a balance of probability in favor of his proposed conclusion. But other thinkers, following a similar procedure, reach a balance of probability in favor of quite different conclusions. Hence the criterion actually operative in his argument (as in theirs) is no objective criterion at all. What does the word "probability" mean in philosophical discussions, and how can the claim that a certain outcome is more probable than its alternatives be sufficiently buttressed? Until these questions are satisfactorily answered the logical fissure between data and conclusions remains unbridged, and hostile critics of all metaphysics can insist with increasing plausibility that there is no way by which verifiable can be distinguished from unverifiable assertions in this unsubstantial and irresponsible realm. What is the virtue of exercising such acumen in erecting one's superstructure when, for all one knows, it has no foundation?

E. A. BURTT

CORNELL UNIVERSITY

Philosophic Foundations of Quantum Mechanics. By HANS REICHENBACH. Berkeley and Los Angeles, University of California Press, 1944. Pp. x, 182.

The problem of interpreting quantum mechanics has been a source of much debate among both physicists and philosophers. Some claim that an adequate interpretation must wait until quantum mechanics is further developed. Others contend that all that is required is a clear-cut logical analysis of existing quantum mechanical concepts. Reichenbach does not exclude the possibility that future experimental results may upset the structure of quantum theory, but he does claim that quantum mechanics as it now stands is a fit subject for logical analysis and interpretation. The major purpose of the present volume is to give such a logical analysis of quantum theory and to propose an interpretation. It is in this sense that Reichenbach's work is "philosophical".

From the body of quantum theory Reichenbach selects a set of principles which are "basic" in that from them all other quantum mechanical principles are derivable. The most important of these basic principles are the following: 1) *Physical entities* in a given context are characterized by operators, eigen-functions, and eigenvalues determined by the first Schrödinger equation. 2) *Physical situa-*

tions are characterized by ψ-functions which determine probability distributions through the application of rigorous rules. Conversely, ψ-functions may be ascertained unambiguously in terms of statistical data. 3) The *time dependence* of ψ-functions is given by the second Schrödinger equation. 4) A *measurement* of an entity *u* is a physical operation relative to which the ψ-function of the physical situation is represented by one of the eigen-functions of *u*.

Two of the most interesting of Reichenbach's "derived principles" are the "principle of indeterminacy" and "disturbance of the object by the measurement". Indeterminacy results from the impossibility of measuring simultaneously entities with noncommutative operators. Disturbance of the object by the measurement arises when the attempt is made to escape the latter difficulty by performing successive measurements upon noncommutative entities. But a successive measurement means that the measurement of one of the entities is not given immediately and, hence, must be inferred through the use of a ψ-function. Thus, an exact determination of the measurement remains impossible. Since this analysis makes indeterminacy logically prior to disturbance of the object by the measurement, Reichenbach rejects Heisenberg's argument for an inverse relationship between these principles as well as all of the philosophical subjectivism which has been associated with Heisenberg's argument.

In developing the more general aspects of his interpretation of quantum theory, Reichenbach combines the results of his strict logical analysis with certain epistemological assumptions. Two of the most important of these are the following: 1) Statements about the physical world are meaningful only in so far as they are verifiable. 2) All descriptions which "fit the facts" are "admissible" and it is a matter of volition which among these is taken as "true". Assumption (1) allows Reichenbach to hold that meaningful causal statements must be reducible to probability statements of the form $A(P_1, P_2, \ldots, P_n)\ \mathfrak{I}_p\ B$ where "in principle" the probability p can be made to approach 1 as a limit by sufficiently increasing the number of parameters $P_i (1 \leq i \leq n)$. Coupling this with indeterminacy, Reichenbach concludes that statements requiring the use of noncommutative parameters cannot be interpreted causally since the probabilities involved cannot be made even in principle to approach 1. Thus, quantum mechanical statements may be divided into two classes, namely, those that are consistent with causal principles and those that are not. The first are referred to as statements about "phenomena" and the second as statements about "interphenomena". Assumption (2) raises the question of the nature of admissible descriptions for phenomena and interphenomena. To be in agreement with classical physics these descriptions must contain a "normal system" defined by the fact

that laws of nature are the same for both phenomena and interphenomena. It is a normal system which classical physics selects as true. Reichenbach argues that a normal system does not exist for quantum mechanics since any attempt to establish such a system leads to causal anomalies.

This result leaves open the following alternatives: 1) We may reduce the number of causal anomalies to a minimum by adopting either a corpuscle or wave interpretation. The anomalies resulting under these interpretations are not "malignant" since they can be "transformed away" to the extent that though there is not a normal system for *all* interphenomena there is such a system for *every* interphenomenon. 2) We may select a rule of procedure which will eliminate causal anomalies altogether. Bohr and Heisenberg, for example, restrict meaningful statements to statements about phenomena. Reichenbach contends that this rule is too strong since it requires the formulation of indeterminacy as a semantical rule, while it is more "natural" to state physical laws in the object language. To achieve this latter result Reichenbach proposes the use of a 3-valued logic. Three topologically distinct truth-value categories are assumed, namely, "truth", "falsehood", and "indeterminacy". The key idea is to identify the class of assertable statements with the class of true statements, including quantum mechanical statements of physical law, and to relegate statements involving causal anomaly to the category of indeterminacy. This replaces the Bohr-Heisenberg rule restricting meaning by a rule restricting assertion, with the result that physical laws are stated in the object language.

In spite of the desirable results obtained through the application of a 3-valued logic to quantum mechanics, Reichenbach concludes that we are left with a "deficiency", namely, the mere fact that we are forced to use a 3-valued logic to achieve the desired results. Any choice we make, then, from among the admissible descriptions of quantum mechanics leads to deficiencies. This result takes Reichenbach to his most general conclusion: "The deficiencies must . . . be regarded as the linguistic expression of the structure of the atomic world, which thus is recognized as intrinsically different from the macro-world, and likewise from the atomic world which classical physics had imagined" (177).

Interesting and suggestive as Reichenbach's argument is, it embraces some curious features. For example, there is an emphatic attempt to free the argument of all metaphysical distinctions such as "subjective" and "objective", yet, in developing a 3-valued logic for quantum mechanics this very distinction leads to confusion. The truth or falsity of statements in the 3-valued logic are determined by the usual objective criteria, but the criterion for indeterminacy relies in

the end upon such vague epistemic concepts as "unknowable to Laplace's superman" or unknowable in principle (146). This appears to be nothing more than a reliance upon a subjective category generalized in such a way as to leave it none the less subjective and none the better in clarity. This difficulty might be rendered harmless if a 3-valued logic were applied in sufficient detail to the whole of quantum mechanics with a resultant suppression of all causal anomalies, but Reichenbach's selected examples are hardly adequate to achieve such a general result. In fact, it is probable that quantification would be desirable for such a detailed application of 3-valued logic, and even the formal features of 3-valued quantification have as yet to be completed.

Reichenbach's failure to face squarely such distinctions as subjective and objective is reflected at many points in the argument. This failure carries with it the usual pitfalls and allows the writer to preface his work with the assertion that he will analyze only our *knowledge* of the physical world, and yet to conclude that our *macro-world* is "intrinsically different" from the *atomic world,* which in turn is very different from what classical physics had supposed.

A. R. TURQUETTE

CORNELL UNIVERSITY

Nietzsche dionisíaco y asceta. Su vide y su ideario. Por ENRIQUE MOLINA. Santiago de Chile, Editorial Nascimento, 1944. Pp. 231.

In Latin America, as well as in other parts of the world, the German thinker, Friedrich Nietzsche (1844-1900), was discussed on the hundredth anniversary of his birth. The Buenos Aires daily, *La Nación* (Oct. 15, 1944), for example, published articles on the German by Argentine writers. In Chile, a book was written about Nietzsche by Dr. Enrique Molina who is professor of philosophy and president of the University of Concepción in the city of the same name. He visited the United States as recently as 1940, and had also been in this country previously. Author of many volumes on education and philosophy, the Chilean wrote not long ago his *Confesión filosófica* (1942) in which he clearly outlined his philosophical outlook.

In his book on Nietzsche, Molina not only gives a readable account of his life and ideas and an extensive bibliography, but also expresses his own judgment about the German. This latter is of special interest to us. Nietzsche, according to Molina, was "above all a libeler, a great poet, and a master of style". He was an impressionist and possessed keen psychological penetration. These were his essential qualities. But, the Chilean says, it is an error to think of Nietzsche as a philosopher. He did not, for example, refute other doctrines by the method of reasoning but by invective. Furthermore, he assailed many philosophers

personally. Finally, "whoever takes Nietzsche as a model, if he does not assimilate him carefully with small doses of which he is sometimes a tonic, exposes his soul to destruction and makes his life a disaster".

Professor Molina considers also Nietzsche's ideas in connection with Nazism in Germany, and Christianity and democracy in the United States. With regard to the former, he says that Nietzsche's "thesis of violence, war, cruelty, and impassibility before pain, fits the Nazi postulate perfectly". Concerning the German's idea that Christianity and democracy make for decadence, Molina writes that "the culture of the United States is fundamentally on a Christian basis, and has been up to now very far from being an effeminate form of decadence. Its chief characteristics are extraordinary activity and energy, faith in the virtues of labor and exertion, and the inventive spirit—all united and harmonized within ample human meaning. Men have formed few societies of better quality than those of New England which were composed almost entirely of Puritans and Quakers. The Gospel did not give life to soft men, but to severe types, firm and inflexible. The example of the United States can serve also to clear democracy in great part from the blots with which Nietzsche covered it".

Molina not only points out, as others have done, that Nietzsche's doctrines are often contradictory to one another, but also says that certain of his basic ideas are contrary to what he himself was as a person. Nietzsche denied the possibility of objective truth, yet sought passionately for knowledge; he ridiculed idealism, yet himself was an idealist; he boasted of immoralism, although he "adjusted his life to a severe morality"; he exalted the will to power, but himself lacked power or wealth. Professor Enrique Molina concludes his book with the judgment that Nietzsche "was verbally a Dionysian, but in reality an ascetic".

JOHN H. HERSHEY

BRIDGEWATER, MASS.

Filosofía contemporánea. Estudios y notas. Primera serie. 2a edición. Por FRANCISCO ROMERO. Buenos Aires, Editorial Losada, S.A., 1944. Pp. 209.

This volume contains a collection of writings previously published in magazines, pamphlets, newspapers and books. The first essay characterizes Nicolai Hartmann as a philosopher of "problematicity" because he commends the monographic approach to recurrent problems. A second essay, *Temporalismo,* compares the views of Husserl, Weininger, Bergson, Simmel, and Heidegger, in order to show that time has finally received proper attention. However, the adjustment of the relative claims of the temporal and the timeless (intelligible essences, values) remains a pressing problem. *Two Conceptions of*

Reality shows that the replacement of atomism in physics, psychology, philology, and history by the structuralist (*Gestalt*) conception requires an exploration of the nature and function of structures and their relation to traditional categories. *Descartes and Husserl* shows that the purpose of the former was metaphysical and of the latter, epistemological. It contains revealing analyses of presuppositions in the *cogito*. *Loss and Recovery of the Subject in Husserl* compares three conceptions of the self in Husserl's writings and suggests that he was over-cautious before admitting the historical nature of the self. *R. Müller-Freienfels and Values* outlines how, by means of successive stands toward previous stands toward emotional experiences, Müller-Freienfels arrives at an ideal or normal self by means of Vaihinger's concept of fiction. He erred by remaining on the empirical level and neglected the lesson of the history of philosophy which gives evidence of human aspiration toward a transempirical order of knowledge, being, and value. This very aspiration is the real problem. Other less pretentious essays deal with literature and developments in philosophy of culture, ethics, psychology, ontology, and characterology. It goes without saying that the brevity required here cannot do justice to the full development of the author's ideas.

The fact that these essays first appeared (and others continue to appear) in such a variety of places suggests that many of them were intended for the lay reader and student. These abound in picturesque characterizations of philosophers, analogies which give the "feel" of the writer discussed, striking analyses of origins and turning points in movements of thought, attractive dramatizations of their course, and apt illustrations to convey lessons about philosophical fallacies. Perhaps this is one of the reasons for a second edition. Certainly this work of enlightenment continues an aspect of the work of Alejandro Korn, to whose memory the volume is a tribute.

While presentation of one's work in this form is an impressive record of work done over a period of fifteen years, it also makes a certain amount of repetition inevitable. Repetition has the advantage of giving emphasis, if dignified eloquence, enthusiasm, and criticism did not by themselves reveal the author's views. For Romero, man is a being not for death, but for value (50). Romero cherishes Simmel's notion of transcendence (45); Scheler's doctrine of the objectivity of spirit, whose infinity, as one essential character, is often overlooked (172); and the structuralistic view which, like many of his guiding ideas, derives from Romanticism. While the selection of "contemporary" philosophers seems too narrow, the volume is only the first of a series on this topic.

O. A. KUBITZ

UNIVERSITY OF ILLINOIS

The Tractatus de Successivis attributed to William Ockham. Edited with a Study on the Life and Works of Ockham by PHILOTHEUS BOEHNER. Franciscan Institute Publications. No. I. St. Bonaventure College, The Franciscan Institute, New York, 1944. Pp. xiii, 122.

This edition of an important part of Ockham's physical writings by an outstanding medieval scholar will be welcomed by ordinary students of philosophy as well as by specialists. Father Boehner has already edited the first question of the prologue of the first Book of Ockham's Commentary on the Sentences, Question 8, Distinction II of the same, two questions of the second Book, and the spurious Centiloquium theologicum, and has also given us several studies of Ockham's philosophical doctrine. Altogether his work is the most careful and informative we have on a philosopher who is frequently referred to, but very little known or read.

The Tractatus de Successivis is a compilation of extracts from Ockham's *Expositio in libros physicorum* and is, to this extent, quite authentic. The compilation, however, was not made by Ockham himself. It covers three physical subjects, viz. motion, time, and place. The philosopher who wishes to understand the doctrine set forth in the Tractatus had first better read P. Vignaux's article "Nominalisme" in the Dictionnaire de Théologie Catholoque (t. 11, pt. 1, 1931) since the general histories are very misleading. Ockham's nominalism lies at the foundation of his treatment of place, time, and motion. Universal terms are imposed on singular things because of their several individual resemblances but, beyond this, have no peculiar and proper referents, nevertheless, the definition of a universal term signifies an essential character which is duplicated in each of the singulars to which it is properly applied. There are terms, however, which have merely a nominal meaning (*quid nominis*) and signify no essence. When these terms are elucidated it turns out that they stand, not for a single characteristic (essential or accidental), but for a set of propositions. Such terms are very like what modern logicians call logical constructions. And thus motion, time, and place are, Ockham argues, not realities distinct from things and from their qualities. When their meanings are properly explained such terms are supplanted by propositions. For example, "to be moved locally" means "first to have one place, and, nothing else having been posited, later to have another place . . . and the moving body is not in any two places simultaneously nor did it rest in those places" (46). If this is valid, "motion" is not the name of a single thing or state but rather of a set of conditions represented by a conjunction of propositions asserting that such a set exists and what its constituents are.

Ockham's positive views are backed up with a veritable arsenal of

arguments against those who would hypostasize "motion", "place", "time", and in general "relation". Among the principles on which he most frequently and heavily depends for his negative critique of this kind of realism, those of *parsimony* and *non-contradiction* are of most importance. The law of non-contradiction is made to yield the conclusions that universals are terms or signs rather than things, and that relational terms signify no reality distinct from things and qualities. The latter proposition underlies some of the most important arguments for the reduction of "motion", "time", etc. to the status of nominal meanings. Ockham thus establishes that mutation (*i.e.*, sudden change) is not something distinct from a permanent substance, that continuous motion is not distinct from permanent things, and that Aristotle's definition of motion is consistent with these views. He then proceeds to show that place is not distinct from the locating body, and finally that time is not a distinct reality.

A considerable amount of light would be thrown on some modern philosophical doctrines (for example, Leibniz's views on extension, space, and time) by a study of these doctrines of William of Ockham. This present edition makes them easily available for the first time. Father Boehner has further enhanced his valuable contribution by an excellent biography of Ockham in the preface. He has also given a bibliography of the authentic and doubtful writings of Ockham.

JULIUS R. WEINBERG
UNIVERSITY OF CINCINNATI

The Neo-Idealist Political Theory: Its Continuity with the British Tradition. By FREDERICK PHILIP HARRIS. New York, King's Crown Press, 1944. Pp. ix, 133.

This volume is a re-examination of the political philosophy of the English idealists, particularly Bradley, Green, and Bosanquet, with a view to considering their place in the tradition of British political thought. Its thesis is that the idealists remained securely within the development of English liberalism, despite the effect upon them of their study of Hegelianism in Germany. In short, Mr. Harris's conclusions reinforce the interpretation of idealism by Muirhead and A. D. Lindsay, and rebut that of Rudolph Metz, who regarded idealism as a reaction against the native liberal tradition occasioned largely by German influence. The ground for the author's conclusion is that idealism was throughout its history an individualist social philosophy and that the idealists were instrumental in revising the conception of the individual which had dominated the thought of Bentham and the earlier liberals. For them the individual had been aggressive, economic, and competitive. Self-realization in the idealist ethics meant a socialized individual, dependent upon cooperation and capable of assimilating a large measure of collectivism. Mr. Harris points out

the affinities of J. S. Mill's hedonism with self-realization, the similarities of Green's practical purposes with those of the utilitarians, and the fact that later scholars like Cole and Laski, who began under the influence of the idealists, passed over easily into some form of socialism. His account of the idealists is at once sympathetic and judicious. In general he proves his case. Possibly some allowance should be made for the fact that, with passage of time, the idealists fall into a larger context because the historian changes his criterion. The controversial differences that bulked large when Green and Bradley attacked classical empiricism are no longer live issues.

GEORGE H. SABINE
CORNELL UNIVERSITY

A Realistic Philosophy: The Perennial Principles of Thought and Action in a Changing World. By K. F. REINHARDT. Milwaukee, The Bruce Publishing Company, 1944. Pp. xii, 268.

This is one more textbook of Thomism. Its distinctive features seem to be that, while it is relatively simple and elementary, it is nevertheless a complete exposition, in that all major aspects are covered—ethics and political philosophy as well as metaphysics and theory of knowledge. The book is blandly orthodox; in his social views the author is liberal—with the liberalism of the Popes. And he shows scarcely a suspicion of the graver objections which have been made to Thomism, nor of the important metaphysical alternatives which are now available. Thus that any such systems as those of Peirce or Whitehead exist could never be guessed from this book. This is not untypical of Thomists. The author claims that Maritain and Gilson are masters of modern as well as of medieval thought. Having read these writers, I can only state my conviction that what they do not know of modern theology and philosophy is the larger part of what is worth knowing. On the whole, the student of their works (or of this one) will learn at most to be wise as medieval philosophy was wise; but if there were any major oversights or errors in the groundwork of Thomism, he will be given almost no aid toward their discovery. The insights of Fechner, Berdyaev, Niebuhr, Whitehead, and many another will not be for him. This is a perfect example of a good tradition deifying itself and becoming the inveterate enemy of the best. Undoubtedly one can do much worse in philosophy than being a Thomist. But the many valuable concepts, like those of potency and actuality, which it contains are also contained, enriched by many new ones and freed of many ambiguities and errors, in the best of recent theology and metaphysics. The foregoing is a purely dogmatic statement, but I suggest it is significant that Thomists are forever contrasting themselves with the *more inadequate* of modern alternatives, such as subjectivism; just as positivists or empiricists are fond

of attacking the more vulnerable types of metaphysics, such as (in my opinion) is Thomism itself. In this din of controversy between opposite extremes, it occurs only to a minority that the truth is probably not in any of them, but in a doctrine more balanced and subtle than can be covered by conventional classifications. Thus to the question, is God (if he exists) the wholly absolute being of traditional theology, or is he something wholly relative, the answer may well be, neither, but a being absolute in some aspect and relative in some other. Similarly with many an alternative discussed in this and other Thomist writings. In this school, as in many newer ones, it is the deplorable practice to employ the argument by elimination, without the slightest care to see that the doctrines considered cover the logical possibilities, and not much care to see that they cover the historical actualities. For example, in his useful Glossary, Professor Reinhardt contrasts "theism" and "pantheism" in such a way as to imply a necessary choice between them (disregarding polytheism and sheer atheism), in spite of the logical possibility and frequent recent occurrence of a view which combines some elements of theism and some of pantheism, as defined. This intermediate view, sometimes called panentheism, is thought by many to be more coherent than either conventional theism or conventional pantheism.

It is only fair to say that the book is excellent as exposition, being pleasantly and clearly written. It is indeed a great advantage not to have to expend much energy deciding *what* to expound—an advantage which may not last forever in the same degree, since some other tradition may eventually come to be as generally acceptable as Thomism is, or will then be, to Roman Catholics, but which while it lasts is bound to produce effects. The author has done his chosen job well.

CHARLES HARTSHORNE

THE UNIVERSITY OF CHICAGO

Public and Private Government. By CHARLES EDWARD MERRIAM. New Haven, Yale University Press, 1944. Pp. ix, 78.

This volume contains four lectures, delivered on the Mahlon Powell Foundation at Indiana University in 1943, which treat three current problems of political organization, the relation between government and private organizations, the relation between national states, and the problem of harnessing a growing administrative organization to the purposes and forms of a democratic society.

In the first lecture, "Public and Private Government", Professor Merriam finds that the character of public and private governments is very nearly the same. He believes that the equilibrium between the two can be most easily established in a democratic society like our own for in such a society each finds its justification in its contribution to the common good, liberty, and justice. Thus in each issue of con-

flict the decision would not be between the rights of private associations pitted against public claims, but between the claim of each to achieve a common end.

In the second lecture, "Sovereignty", he is sanguine about removing what was hitherto a major conceptual barrier to international cooperation. After briefly reviewing the development of the concept of sovereignty, he concludes that its essence lies not in the attributes of absolutism and irresponsibility but "in the focusing of recognized authority for the purposes of the common good, in the concentration of power necessary for community action". Thus it would appear that if the needs of community action today required a recognition of international authorities, such a recognition would be a fulfillment rather than a violation of this growing concept.

"New Meanings of Organization", the third lecture, is a review of new developments in the field of administration and of contributions to the idea of organization made by science, sociology, anthropology, and economics as well as by those fields more intimately related to the problems of public and business administration. The main conclusion of this and the last lecture, "Democracy and Organization", is that the two widespread views, first, that the administrative process is essentially undemocratic, and second, that democratic government is not as efficient as dictatorship, are belied by recent developments in the science of administration which show that efficiency increases where there is a wider participation in determining the ends and processes of administration.

This book is not a call to action; it does not contain detailed solutions to current governmental problems; but it does deal effectively with some fundamental concepts which, for many, have inhibited action. It is thus a valuable aid to those who have found it difficult to reconcile traditional views of government, of bureaucracy, and of sovereignty with recent trends toward increasing governmental functions, larger administrative organization, and the growth of international political institutions.

CHARLES R. NIXON

SMITH COLLEGE

Philosophical Understanding and Religious Truth. By ERICH FRANK. New York, Oxford University Press, 1945. Pp. x, 209.

The profundity of this little book is masked by its brevity and by its closely packed substance. It will repay close attention.

Dr. Frank addresses himself in these lectures to a historical and critical clarification of the problem suggested by the title; he does not attempt its solution. His thesis is that philosophical understanding, unenlightened by religious faith, takes for granted the rational self-sufficiency of man. Religion, however, challenges this assump-

tion. Religious experience compels man to become poignantly aware of his dependence, and that of the world discovered by reason, on a reality that transcends reason. As a result of this awareness philosophy is forced to scrutinize its own presuppositions, to see what errors they may have harbored and how those errors are to be corrected. From this scrutiny it finds that it must take seriously certain ideas whose meaning is derived solely from this experience of dependence but which from a rational viewpoint are baffling—creation as different from causation, destiny as distinguishable from a temporal end, progress as distinct from history. It finds also that when these ideas are taken seriously it must gain a new orientation with respect to other problems which they affect—the problems of time, of freedom, of truth. Religion thus compels reason, first to recognize its own limitations, and second to wrestle with the perplexities which arise from consciousness of a reality that lies beyond those limitations. In the endeavor to resolve these perplexities lies the perennial task of philosophy.

One hopes that the author, in another volume, will describe more fully how philosophy carries out this apparently hopeless task, and by what criteria it distinguishes success from failure.

E. A. BURTT

CORNELL UNIVERSITY

An Introduction to Philosophy. By W. A. SINCLAIR. London, Oxford University Press, 1944. Pp. 151.

There are two ways of introducing novices to philosophy. One is like handing a traveller a Baedeker; the other, Mr. Sinclair's, is like introducing a horse to pasture, by allowing him to crop a bit of the grass. It has admirable advantages: it runs no risk of producing in the reader the complacent conceit that, by reading the book, he has learned all that the 'intelligent' or 'educated' person needs to know about the subject; it shows the reader what philosophy is by presenting him with an example of simplified but perfectly genuine philosophical inquiry, by the effort of following which he may "experience what it feels like to think philosophically"; and it gets its work done with a minimum of fuss and in the shortest possible time.

Many will not agree that our widest and most comprehensive assumptions are those about the nature of knowledge, and some who do agree would not consider these as setting the problem best suited to exhibit philosophical thinking to the uninitiated. But few would deny that Mr. Sinclair has succeeded uncommonly well in writing simply and intelligibly and constructively about theory of knowledge. Moreover, his remarks on learning philosophy, his hints about other

philosophical fields, his advice on the books to read next after his own—all these are invariably fresh and invariably sensible.

It is contrary to the intention and temper of this book to make it a text for class study. A good many teachers of philosophy, nevertheless, may be glad to place it informally in the hands of beginners.

The book is clearly printed on good paper and is well bound. One wonders, however, whether its purpose would not be better served if it were brought out in a much cheaper edition.

JAMES STREET FULTON

OTTAWA, ONTARIO

The following books have been received:

No Voice is Wholly Lost . . . Writers and Thinkers in War and Peace. By HARRY SLOCHOWER. New York, Creative Age Press, 1945. Pp. xx, 404.

Thomistic Bibliography, 1920-1940. By VERNON J. BOURKE. St. Louis, Missouri, *The Modern Schoolman,* Supplement to Volume XXI, 1945. Pp. viii, 312.

The Sociology of the Family. By M. C. ELMER. Boston, Ginn and Company, 1945. Pp. xxii, 520. (*Social Science Series,* edited by R. M. MacIver, Columbia University.)

Galen on Medical Experience. First Edition of the Arabic Version with English Translation and Notes. By R. WALZER. Published for the Trustees of the Late Sir Henry Wellcome by the Oxford University Press, London, New York, Toronto, 1944. Pp. xi, 164.

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Rousseau, Kant, Goethe: *Two Essays.* By ERNST CASSIRER. Translated from the German by JAMES GUTMANN, PAUL OSKAR KRISTELLER, and JOHN HERMAN RANDALL, JR. Princeton, Princeton University Press, 1945. Pp. x, 98. (*History of Ideas Series,* I.)

A History of Philosophy. Revised Edition. By B. A. G. FULLER. New York, Henry Holt and Company, 1945. Pp. viii, 560.

The Classical Republicans. An Essay in the Recovery of a Pattern of Thought in Seventeenth Century England. By ZERA S. FINK. Evanston, Northwestern University, 1945. Pp. xii, 225. (*Northwestern University Studies in the Humanities,* Number Nine.)

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NOTES

Dr. Harold Alexander Taylor, formerly a member of the Department of Philosophy in the University of Wisconsin, has been elected president of Sarah Lawrence College. Dr. Taylor received his B.A. and M.A. degrees from the University of Toronto, and his Ph.D. degree from the University of London.

Philosophy in the Army Education Program for Troops in the European Theater of Operations.

1. *University Study Centers.* The War Department has announced the establishing of two Army University Study Centers in England and France for troops in the European Theater. There is a comprehensive program of education which provides for study in several distinct forms, viz: (a) study and training in unit schools operated by and within battalions and similar military units; (b) training in a centralized vocational school; (c) study in the Army's system of correspondence courses through the United States Armed Forces Institute; (d) study in civilian educational institutions; and (e) study in Army University Centers set up especially for the purpose of offering college and university courses of study.

The program of University Study is being presented for enlisted personnel and officers not engaged in full time military duties who can make effective use of this plan by pursuing a course of study in keeping with their individual postwar plans and ambitions.

The first of the two Army University Centers is scheduled to open the latter part of July in Shrivenham, England. With an enrollment of about 4000, the center will offer courses in agriculture, commerce, education, engineering, fine arts, journalism, science, and liberal arts. The courses will be patterned on the average American university summer session and will be of eight weeks' duration.

The Army Education Program in the European Theater of Operations is directed by Brigadier General Paul W. Thompson, Director of the Theater Information and Education Division.

2. *Philosophy in the Army University Study Centers.* Philosophy is offered in the Study Centers. The determination of the precise courses will be made by the faculty in the light of their experience of the needs of the men who elect philosophy as a subject of study. The original program includes the staple courses that are recognized by the colleges and universities throughout the country—courses such as Principles of Philosophy, Ethics, Logic, and History of Philosophy.

Professor Charles W. Hendel of Yale University has been appointed Head of Philosophy charged with the responsibility for selection of personnel and determination of the policy in regard to courses of study and methods of instruction. He will start off with the first Study Center at Shrivenham, near Oxford.

The following other members of the profession have been appointed:

Dr. Carl F. Taeusch, Head of the Division of Program Study and Discussion, Bureau of Agricultural Economics, United States Department of Agriculture, Washington, D.C., to take charge of Philosophy in the Study Center in France.

Professor Eugene T. Adams, Colgate University (and until recently in the U. S. Navy), for France.

Professor Laurence Sears, recently of Ohio Wesleyan University and subsequently of Mills College, California, for France.

Professor James S. Fulton, McGill University, until recently Royal Canadian Navy, for England.

Professor Radoslav Tsanoff, Rice Institute, for England.

Further additions to the staff may be made from members of the profession still in the Army. There are also some professors available for service at some later date, if needed.

The following is a list of articles in current philosophical periodicals:

MIND LIV 214: *C. G. Hempel,* Studies in the Logic of Confirmation (II.); *W. T. Stace,* The Problem of Unreasoned Beliefs (II.); *R. Carnap,* Hall and Bergmann on Semantics; *C. H. Whiteley,* Hempel's Paradoxes of Confirmation; *A. Ushenko,* A Note on the "Argument from Illusion".

THE JOURNAL OF PHILOSOPHY XLII 10: *W. H. Sheldon,* Critique of Naturalism; *Lucius Garvin,* Retributive and Distributive Justice. 11: *DeWitt H. Parker,* Esse Est Percipi, with Particular Reference to Number; *John MacPartland,* Aristotle and the Spectator Theory of Knowledge. 12: *Wm. Pepperell Montague,* The First Mystery of Consciousness; *Morton G. White,* The Attack on the Historical Method. 13: *Henry David Aiken,* Definitions of Value and the Moral Ideal; *H. Richard Niebuhr,* The Ego-Alter Dialectic and the Conscience. 14: *James Feibleman,* Peirce's Use of Kant; *Frances Murphy Hamblin,* A Comment on Peirce's "Tychism"; *Paul Weiss* and *Arthur Burks,* Peirce's Sixty-Six Signs.

ETHICS LV 3: *Walter Sulzbach,* Some Basic Problems of a League of Nations; *Felix S. Cohen,* Colonialism: A Realistic Approach; *Raphael Demos,* What is it That I Want?; *Homer H. Dubs,* The Logical Derivation of Democracy; *Charner Perry,* Sound Ethics and Confused Language; *Gardner Williams,* The Moral Insignificance of the Total of All Value.

SOCIAL RESEARCH XII 2: *Erich Hula,* The Dumbarton Oaks Proposals; *Hans Speier,* War Aims in Political Warfare; *John Lindberg,* Food Supply under a Program of Freedom from Want; *Hedwig Reinhardt,* On the Incidence of Public Debt; *Ernest Hamburger,* Significance of the Nazi Leisure Time Program; *Alvin Johnson,* Commentary on "Industrial Society and Democracy".

THE ANTIOCH REVIEW V 1: *Eduard C. Lindemann,* The Professionals; *Charles E. Noyes,* The Profession of Management; *Jules Abels,* The Impact of the War on Small Business; *Donald Montgomery,* Consumers Gird for Battle; *Elizabeth Hawes,* The Woman Problem; *Frieda Wunderlich,* Fascism and the German Middle Class; *Lewis Corey,* Problems of the Peace: IV. The Middle Class; *David Dempsey,* Green Troops on a Blue Beach . . . *reportage; Granville Hicks,* Landlord Cooper and the Anti-Renters; *Dan G. Hoffman,* The Folk Art of Jazz; *Charles A. Madison,* John Peter Altgeld: Pioneer Progressive; *Alton Parker Thomason,* Authority, Order, Discipline, Loyalty; *K. G. Hansson,* Rehabilitation; *The Editors,* We Note; The Reader Writes.

THOUGHT XX 77: *Ignatius W. Cox,* Pillars of Peace; *Gerald G. Walsh,*

Triumph and Tragedy of Christendom; *Francis C. Balling,* Unconditional Surrender; *Gerard Smith,* The New English St. Thomas; *Friedrich Baerwald,* Catholic Resistance in Nazi Germany; *Francis G. Wilson,* Public Opinion in the Theory of Democracy; *John E. Wise,* Newman and the Liberal Arts; *Victor M. Hamm,* Mr. Lewis in Perelandra; *H. A. Hatzfeld,* Catholic Spirituality in Recent French Literature; *Guido Errante,* Old Provençal Lyric Poetry, Latin and Arabic Influences.

THE JOURNAL OF RELIGION XXV 2: *Wilhelm Pauck,* The Prospect of Ecumenical Theology Today; *James Luther Adams,* The Law of Nature: Some General Considerations; *James Luther Adams,* The Law of Nature in Greco-Roman Thought; *S. MacLean Gilmour,* Paul and the Primitive Church; *Eugen Rosenstock-Huessy,* Hitler and Israel, or On Prayer.

THE REVIEW OF RELIGION IX 4: *Solomon Simonson,* Four Modes of Interpretation; *Robert Leet Patterson,* "Universal Religion" and Special Revelation; *Troy Organ,* Pluralistic Christianity; *Charles E. Trinkaus, Jr.,* Man and Faith in the 'Forties: A Review Article.

THE NEW SCHOLASTICISM XIX 2: *Theodore P. Roeser,* Emanation and Creation; *J. F. Donceel,* What Kind of Science is Psychology?; *Max Guzikowski,* A Public Opinion and Thomistic Principles; *Sister Cyril Edwin Kinney,* George Santayana.

ANGLICAN THEOLOGICAL REVIEW XXVII 2: *Goodrich Robert Fenner,* The Teaching Church; *J. V. Moldenhawer,* Shakespeare Answers the Query, "What is Man?"; *Charles W. F. Smith,* The Horse and the Ass in the Bible; *Herbert H. Stroup,* A Philosophy of Value; *Charles R. Greenleaf,* Embertide: A Lost Christian Season; The Church and the World (Church Congress Syllabus 38); *Grace Amadon,* Important Passover Texts in Josephus and Philo; *Oscar F. Green,* Humor in Preaching; *Clifton H. Brewer,* God in Education.

THE HARVARD THEOLOGICAL REVIEW XXXVIII 2: *Vivian and Isaac Rosensohn Jacobs,* The Myth of Môt and 'Al'eyan Ba'al; *Maurice W. Armstrong,* Religious Enthusiasm and Separatism in Colonial New England; *Francis Lee Utley,* The Layman's Complaint and the Friar's Answer.

SPECULUM XX 2: *Margaret Schlauch,* Chaucer's Doctrine of Kings and Tyrants; *Josiah Cox Russell,* Late Mediaeval Population Patterns; *Howard Meroney,* Irish in the Old English Charms; *Roger S. Loomis,* Morgain La Fee and the Celtic Goddesses; *Ruth Cline,* The Influence of Romances on Tournaments of the Middle Ages; *James Bruce Ross,* Two Neglected Paladins of Charlemagne: Erich of Friuli and Gerold of Bavaria; *F. J. E. Raby,* The Date and Authorship of the Poem *Adoro Te Deuote.*

THE AMERICAN JOURNAL OF PSYCHOLOGY LVIII 2: *M. F. Ashley Montagu,* Intelligence of Northern Negroes and Southern Whites in the First World War; *H. M. Johnson,* Are Psychophysical Problems Genuine or Spurious?; *M. Bentley,* Sanity and Hazard in Childhood; *R. B. Malmo* and *Howard L. Andrews,* A Recording Device for Foot-Tapping, with Results from Polyneuropathic Subjects; *E. Murray,* Alleged Cures of Color Blindness; *C. Rodhom,* Cultures, Rats and Men; *H. M. Johnson,* John Madison Fletcher, 1873-1944.

PSYCHOLOGICAL REVIEW LII 3: *Gordon W. Allport,* The Psychology of

Participation; *Clark L. Hull,* The Discrimination of Stimulus Configurations and the Hypothesis of Afferent Neural Interaction; *Edward L. Thorndike,* The Association of Certain Sounds with Pleasant and Unpleasant Meanings; *H. Heath Bawden,* Primary and Secondary Behavior; *Ivan D. London,* Psychology and Heisenberg's Principle of Indeterminacy; *S. Howard Bartley* and *Eloise Chute,* A Preliminary Clarification of the Concept of Fatigue; *Isidor Chein,* The Logic of Prediction: Some Observations on Dr. Sarbin's Exposition; *Walter A. Lurie,* John Madison Fletcher: 1873-1944.

JOURNAL OF EXPERIMENTAL PSYCHOLOGY XXXV 2: *B. Reynolds,* Extinction of Trace Conditioned Responses as a Function of the Spacing of Trials during the Acquisition and Extinction Series; *H. H. Kendler,* Drive Interaction: I. Learning as a Function of the Simultaneous Presence of the Hunger and Thirst Drives; *R. J. Campbell* and *H. F. Harlow,* Problem Solution by Monkeys Following Bilateral Removal of the Prefrontal Areas. V. Spatial Delayed Reactions; *J. E. Birren,* Static Equilibrium and Vestibular Function; *H. J. Leavitt,* The Relation of Speed of Learning to Amount Retained and to Reminiscence; *J. J. B. Morgan,* Value of Wrong Responses in Inductive Reasoning; *C. J. Warden* and *S. Ross,* A Comparison of the Navy Adaptometer Test and the Columbia Motion Acuity Test; *G. Forbes,* The Effect of Certain Variables on Visual and Auditory Reaction Times; *F. L. Marcuse, A. Hill,* and *M. Keegan,* Identification of Posthypnotic Signals and Responses. 3: *S. Koch* and *W. J. Daniel,* The Effect of Satiation on the Behavior Mediated by a Habit of Maximum Strength; *H. H. Kendler,* Drive Interaction: II. Experimental Analysis of the Role of Drive in Learning Theory; *P. S. Siegel,* The Role of Absolute Initial Response Strength in Simple Trial-and-Error Learning; *W. C. Shipley, J. I. Coffin,* and *K. C. Hadsell,* Affective Distance and Other Factors Determining Reaction Time in Judgments of Color Preference; *R. C. Travis,* An Experimental Analysis of Dynamic and Static Equilibrium; *R. E. Taubman,* Apparent Whiteness in Relation to Albedo and Illumination; *F. J. Shaw* and *A. Spooner,* Selective Forgetting when the Subject is not 'Ego-Involved'; *M. E. Bitterman* and *F. L. Marcuse,* Autonomic Response in Posthypnotic Amnesia.

PSYCHOLOGICAL BULLETIN XLII 5: *Helen Sargent,* Projective Methods: Their Origins, Theory, and Application in Personality Research; *Ernest R. Hilgard,* Temporary Chairmen and Secretaries for Proposed APA Divisions; *R. J. Lewinski* and *E. J. Galway,* Psychological Services at a Naval Retraining Command; *A. B. Crawford* and *P. S. Burnham,* Educational Aptitude Testing in the Navy V-12 Program at Yale; *William D. Altus,* Racial and Bi-lingual Group Differences in Predictability and in Mean Aptitude Test Scores in an Army Special Training Center. 6: *Raymond G. Kuhlen,* Age Differences in Personality During Adult Years; *Donald E. Super,* Strong's Vocational Interests of Men and Women; *Howard L. Roy,* A Comparison of the Performance of Freshmen and Sophomores in General Psychology; *Gordon W. Allport,* Human Nature and the Peace; *Various Authors,* Psychology and the War.

JEWISH SOCIAL STUDIES VII 2: *Koppel S. Pinson,* Antisemitism in the

Post-War World; *Rudolf Glanz,* Notes on Early Jewish Peddling in America; *Martin Buber,* Moses Hess; *Erich Rosenthal,* The Size of the Jewish Population in Chicago, 1930; *A. Bein,* The First Zionist Flag; *Zosa Szajkowski,* The Alliance Israélite and East European Jewry; *Judah L. Zlotnik,* Hebrew Terms Relating to Debt.

THE MAHA-BODHI LII 9-10: *Maung Khin,* Is Kalapa Rupa the Atom of Modern Science?; *Anukul Chandra Banerjee,* Pratisamkhya Nirodha & Apratisamkhya Nirodha in Buddhism; *D. B. Jayasinghe,* Dr. Barua's Lecture on Buddhism as Personal Religion; *Shyamlal Sadhu,* The Buddhists of Kashmir. 11-12: *Bhikkhu Metteyya,* The Last Gift; A Foreigner Visits Laos; *C. C. Mani,* Revival of Buddhism in India; *D. T. Devendra.* Buddhism and the Sinhalese.